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NOTES

ON THE

PINKS OF WESTERN EUROPE.

BY

FREDERIC N. WILLIAMS, F.L.S.



Plants as wholes assume unlike attitudes towards their environments; they have many ways of articulating their parts with one another; they have many ways of adjusting their parts towards surrounding agencies. These are causes of special differentiations additional to those general differentiations that result from increase of mass and increase of composition. . . . There is a parallel cause for the parallel differentiations exhibited by all aggregates.—HERBERT SPENCER.



LONDON :

PRINTED BY WEST, NEWMAN AND CO., HATTON GARDEN, E.C.

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INTRODUCTION.

THE grouping of the species in these 'Notes' is in accordance with that followed out in the author's 'Enumeratio Specierum Varietatumque Generis *Dianthus*.' Original references are given for species and varieties not mentioned in Nyman's 'Conspectus,' or where his nomenclature is not followed. The matter relating to each species is arranged under the following heads:—(1) A Latin diagnosis of the species, drawn up after examining and comparing original specimens with the best known descriptions, in which the chief essential and differential rather than the absolute specific characters are given; (2) the countries of Western Europe (as included in the area under consideration) in which the species is *indigenous*, with the vernacular names of the plant (if it has any) in these countries, and in which the following initials indicate the countries named:—

E. = Great Britain.	G. = Germany (small part of).
F. = France (most of).	S. = Spain (Castilian, Catalan,
H. = Holland (and Luxemburg).	and the Basque dialect).
B. = Belgium (Flemish).	P. = Portugal.

(3) the general geographical limits of the species; (4) pre-Linnean references; (5) derivation of the specific name; (6) notes and remarks on the plant and its varieties. The measurements, in centimetres and millimetres, refer to average specimens and to the average length of their parts. Some justification may perhaps be needed of the *ex cathedra* manner in which these pages are written, in the prevailing absence of synonymy, and references to authorities, &c.; were it not that they are rather a digest of results obtained by research, and not merely a compilation. It has not been thought desirable to burden the text with innumerable

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synonyms, which are often no more than the record of the unnecessary labours, as well as the mistakes, of previous observers; and which, in some systematic works, tend to reduce much of the text to a dry and unreadable index.

BRENTFORD,

September, 1889.

NOTES

ON THE

PINKS OF WESTERN EUROPE.

THE genus *Dianthus* was founded by Linnæus, and many of his species are described in the first edition of the 'Species Plantarum,' published in 1753. The name is a most appropriate one, and is one of Linnæus' happiest selections in his generic titles. It is derived from *dios, anthos*,—the divine flower,—in allusion to the singular beauty and fragrance of some of the species. A second derivation is *di, anthos* (double flower); but this is only a concession to the prejudice of horticulturists, who have degraded so many of the "divine flowers" of Nature to the rank of emasculated garden monstrosities.

Caryophyllus was the pseudogeneric term used for many of the species described by the pre-Linnean botanists,—Ruellius ('De naturâ stirpium,' 1536), Dodoens (1554), Tabernæmontanus (1588), J. Bauhin (1591), Grisley (1661), Cupani (1696), Tournefort (1694), and Seguiet ('Plantæ Veronenses,' 1745-1754).

The limits of the geographical range of the genus are :—

N. On the coast of the Kara Sea, in Arctic Russia, lat. 70° N.

E. Alaska, in N.W. America, long. 160° W.

S. Cape of Good Hope, lat. 34° S.

W. Corunna, at N.W. extremity of Spain, long. 8° W.

In Europe the genus is distributed throughout its whole extent, but is absent, however, from Iceland and Ireland; its extreme limits being :—

N. On the coast of the Kara Sea, in Arctic Russia, lat. 70° N. —

D. alpinus.

E. Baku, in Russian Armenia, lat. 50° E.—*D. prolifer*.

S. The island of Crete, lat. 35° S.—*D. sphacioticus*.

W. Corunna, at N.W. extremity of Spain, long. 8° W. — *D. monspessulanus*.

The area of "Western Europe" to which these notes refer includes—The United Kingdom, Holland, Belgium, France, excluding that part E. of the Rhone (Dauphiné, Provence, and Savoy), the part of the German Empire W. of the Rhine, Portugal, and Spain. The only special work bearing upon the subject is 'Observations sur les *Dianthus* des Pyrenées,' by M. Timbal-Lagrange, of Toulouse, which consists of an excellent description of the Pyrenean species.

The vernacular names for the genus *Dianthus* are—in English, *Pink*; in French, *Œillet*; in German, *Nelke*; in Flemish, *Angelier*; in Spanish, *Clavel*; in Portuguese, *Cravina*; and *Armenee* in Luxemburg-Dutch. The English name of *Pink* has been long in use. Gerard, in 1597, speaks of “a wild creeping Pinke which groweth in our pastures neere about London.” It has nothing to do with the colour of the flowers, but is a mediæval English word meaning “an eye, or small eye,” and as such is used by Shakespere; in Dutch, *pinken*, *pinkoogen*, to twinkle with the eye; and in provincial German, *pinkern*, to wink. The French name, *Œillet* (diminutive of *œil*, eye), also illustrates its etymology. *Œillet* = *ocellus* (diminutive of *oculus*); by anglicizing the French pronunciation we get *willie*, hence sweet-william. We will now pass on to the species.

DIANTHUS.

Subgenus I.—CARTHUSIANASTRUM.

Sectio ARMERIUM.

1. *D. Armeria* L.—Tomentosus. Caules 40 centim., subsimplices aut superne parce et dichotome ramosi. Folia plana stricta, infima 48 mm. obtusa, superiora 72 mm. acuta, subfloralia acuminata, vagina folia diam. æquante. Inflorescentia fasciculis obliquis dichotomis 3—8 florum inodororum. Bracteæ lineari-lanceolatæ acuminatæ ad calycis apices. Calyx dentibus lanceolatis acutis. Petala non contigua; lamina oblongo-elliptica, = $\frac{1}{3}$ unguis. Capsula subcylindrica.

var. *cæspitosus* *Clav.* (Flore de la Gironde, 1882, p. 156).

E. (Deptford P.). F. (Œ. velu). G. (rauhe N.). H. B. (duizendschoone A.). S.

Geographical limits, 1026°.

N. Gothland, 56°.

S. Sicily, 38°.

E. Talysch, 49°.

W. Asturias, 8°.

Armeria sylvestris alter (*Lobel*, 1570).

Caryophyllus barbatus sylvestris (*C. Bauhin*, 1596).

Caryophyllus pratensis (*Gerardé*, 1597).

Caryophyllus pratensis noster major (*Parkinson*, 1640).

Caryophyllus latifolius barbatus minor annuus (*Newton*, 1680).

The earliest notice of the plant is by Lobel, a French botanist, whose name survives in the genus *Lobelia*, and whose name for the plant is preserved in the Linnean species. It is remarkable that ten of Bauhin's plants should now be recognised as species. They are—*D. Armeria*, arboreus, *Carthusianorum*, barbatus, plumarius, arenarius, deltoides, alpinus, *Caryophyllus*, prolifer. Caspar Bauhin was born in 1550, and was the most celebrated member of his family; he published his ‘*Pinax Theatri Botanici*’ in 1596, and died in 1624.

In England the plant is annual or biennial, and is found on dry banks, the borders of fields, stony places, sandy slopes of hills, by gravel-pits, gravelly copses for the first year or two after they have been cut, and hilly pastures. Its favourite habitat is on siliceous, granitic, or volcanic soils, and in some parts of France on calcareous cliffs. In the central plateau of Spain, according to Willkomm, it reaches 1000 metres. The absence of this and other species from paludinous districts is to be noted. Owing to its very local occurrence in this country, H. C. Watson was disposed to consider it as somewhat doubtfully a native. On account of the continuity of suburban London, the English name is no longer applicable to the plant. From the petals of the fresh plant Dr. Gulliver obtained the peculiar crystals known as "sphæroraphides." The early red pinks of the florists, which are larger than the pheasant's-eye pinks, seem to have sprung either from this species or from *D. deltoides*; but (in the opinion of many horticulturists) probably from the latter.

In Gothland, its northern limit, it is known as "sarons blomster." According to Asa Gray, it was carried by European colonists to America, where, in some parts of the United States (New York, Delaware, &c.), it has become so far naturalized as to appear almost indigenous.

Sectio CARTHUSIANUM.

Subsectio 1. MICROLEPIDES. — Herbæ perennes. Inflorescentia densa, capitata. Petala nonnunquam imberbia.

2. *D. liburnicus* Bartl. — Glaber. Caules 48 cent. simplices stricti, superne fere quadranguli. Folia plana stricta acuminata, radicalia 75 mm. recurva, caulinea 58 mm. adpressa, vagina folii diam. duplo longiore, subfloralia 2 adpressa coriacea. Inflorescentia capitulis simplicibus 3—6 florum roseorum. Bracteæ 4 acuminatæ ad calycis apices. Calyx dentibus 7-nerviis acuminatis. Petala imberbia contigua; lamina obovato-cuneata, = $\frac{1}{2}$ unguis.

F. (E. de Croatie).

Geographical limits, 208°.

N. Galicia, in Austria, 48°. E. Podolia, in Russia, 30°.

S. Albania, 40°. W. Languedoc, 4°.

Earliest record by Bartling in 1825. If anything would entitle it to specific distinction, in its affinities with similar plants, it would be its maritime station. The original specimens were gathered by Bartling on the shores of the Gulf of Quarnero, in Istria, on a calcareous soil, and it was from these specimens that he and Wendland drew up the classical description. The exact locality was again verified by Herr Pichler in 1884, from whom the British Museum and Kew herbaria have specimens. It is also found at Lerici, on the Gulf of Spezia, where the poet Shelley was

drowned. J. T. Moggridge records it from the Riviera; and its western limit is the maritime department of Hérault. In Austria it extends into the Herzegovina.

From the next species it differs in its non-cæspitose habit, its small beardless petals, and in form and size of bracts and subfloral leaves. This plant has been confused with *D. Balbisii* of the 'Prodromus,' which in nowise differs from the next species, also with Kitaibel's *D. trifasciculatus*, which latter also occurs in Galicia, but differs from *D. liburnicus* in—leaves linear-oblong, patent, scarcely strict, much longer, 5–7-nerved; inflorescence in trichotomous fascicles of dark flowers; and bearded petals.

The Roman province Liburnia included the littoral districts of Carniola and Croatia.

Subsectio 2. *CARTHUSIANOIDES*. — Folia stricta. Bracteæ siccae. Calyx dentibus lanceolatis. Petala obovato-cuneata, barbulata.

3. *D. Carthusianorum* L. — Cæspitosus, glaber. Caules 24—40 centim., e rhizomate multicipite, 4-angulares erecti. Folia acuminata plana 5-nervia, vagina folii diam. sæpius 4-plo longiore, subfloralia oblongo-elliptica ad apices bractearum acutata. Inflorescentia fasciculis paucifloris capitatis. Bracteæ 4 mucronatæ ad dimidium calycem adpressæ, rubellæ fuscae aut flavescentes. Calyx apice attenuato, dentibus 9-nerviis acuminatis. Petala inæquali-dentata, laminâ = unguem. Capsula cylindrica.

var. eu-Carthusianorum L. (Reichenbach, Ic. f. 5011).

var. anisopodus Ser.

var. atrorubens All.

var. congestus G. et G.

var. vaginatus Vill.

var. atrorubens Jacq.

F. (Æ. des Chartreux). H. B. (Karthuizer A.). G. (Karthäuser N.). S. (C. de los Cartujos). P.

Geographical limits, 1539°.

N. Denmark, 55°.

S. Egypt, 28°.

E. Ural, 49°.

W. Portugal, 8°.

Pre-Linnean references.—The earliest notice is that of Arnoldus, who includes it in his "tunica herba." The plant is next referred to by Otto Brunfels in his 'Herbarum vivæ Icones,' 1530; and is also described by Leonhard Fuchs (1545), whose name survives in the genus *Fuchsia*; also by Matthioli (1585), under the name of "Garofoli salvatichi" (in modern Italian, "Garofano salvatico"), who is commemorated in the cruciferous genus *Matthiola*. Was first cultivated by the Carthusians in France about 1573. Among old names for it are:—

Caryophyllus sylvestris (Fuchs, 1545).

Caryophyllus sylvestris vulgaris latifolius (C. Bauhin, 1596).

Caryophyllus arvensis calyculo florum numeroso (Loesel, 1650).

Caryophyllus pratensis (Erndtel, 1730).

Caryophyllus sylvestris flore rubro plurimo de summo caule prodeunte (Sequier, 'Plantæ Veronenses,' 1745-1754).

Matthioli's figure is very good, and sufficiently identifies the plant. The Linnean species was named after the Benedictine order founded by St. Bruno, of Grenoble, in the eleventh century, and who, as stated above, were the first cultivators of the plant. It is commonly met with in association with *Cytisus sagittalis*, *Betonica officinalis*, *Jasione perennis*, *Scleranthus perennis*, and *Sedum* spp., on dry pastures in Central Europe, and is entirely absent from paludinous districts. As to its habitat, Lecoq writes in his 'Botanical Geography':—"On the central plateau it attains its finest development on the scorïæ and pozzulana, which have a soil naturally drained, and where it flourishes vigorously; but another favourite habitat is that of dry pastures exposed to the sun." As it is not found on either coast of the English Channel, it may be taken that the humidity of these parts is as much a cause of its absence as of the absence of hot and dry summers. It ascends to 1000 or 1500 metres on elevated plateaux, or until it finds a dry soil: below this elevation the mists are unfavourable to its growth. In North Switzerland, Wahlenberg found specimens at 1900 metres. In Brittany it is found only in extreme localities in the south-east of the province. Although it is not found in the same localities in France as *D. monspessulanus*, it is found in the departments of Gard and Var. In Belgium it grows near Ghent. The species does not occur in Miquel's 'Catalogue of Dutch Plants' of 1857, but has since been recorded near Deventer, in Over-Yssel. First recorded in Portugal by D. Vandelli, who vernacularized Grisley's names, in 1789. Of all dry localities it prefers those with a siliceous, granitic, or calcareous soil; the drier the station the more hardy and dwarfed it is in habit.

In none of the other species is the polymorphic tendency so evident; though the variations from the type ring the changes on but few of the minor characters, still this has given an unhealthy stimulus to the hair-splitting faculties of many German and Austrian botanists in creating many more species than *Evolution* could possibly be accountable for, even if it jumped from transitions to conclusions, and ignored hybridity!

The rootstock is much branched, and the barren shoots vigorous, numerous, and foliose, thus giving the plant a cæspitose habit. Following up the salient points, we find the stems are smooth, but not shining, angular, and invariably unbranched, unless it may be at the very base, where two branches may spring almost together from the crown. In *D. Schlosseri* and *cruentus* the stems are terete. The leaf-sheath is very long, not short, as in *D. barbatus*. The flowers are in paucifloral fascicles, thus distinguishing it from *D. ambiguus*, *pelviformis*, and *cruentus*. The bracts, unlike those of

D. barbatus, are broad and mucronate. The organs here called *bracts* have received various names in descriptions of the species,—calyculus, épicalyx, involucre, involucl (in *Carthusianastrum*), scales, and bracteoles: and the “bracts” of other authors are, for organogenetic reasons, here called “subfloral leaves.” The calyx is constricted at the base of the teeth, and this character distinguishes it from *D. ambiguus* and *D. Borbasii* in the same group, which have a strictly cylindrical calyx. The petals, as might be expected, vary much in tint, from dark purple to rose-coloured and white, and the dentation is irregular. They do not differ so much in length as in the proportion of lamina to unguis.

Among the species reduced within the specific limits of this plant are—*D. atrorubens* All., Jacq., Bess., Loisel.; *carmelitarum* Reut. (in Fl. Orientalis); *fasciculatus* Gilib.; *ferrugineus* L., Pourr.; *congestus* Bor.; *Pontederæ* Kern.; *croaticus* Borb.; *vaginatus* Chaix., Vill., Rehb.; *sanguineus* Vis.; *vulturius* G. et T.; *lanceifolius* Schloss. et Vukotin; *alpestris* Balb., &c. The species which is nearest to it is *D. Knappii*, which differs from it chiefly in its broader leaves and denser flowers, and is scarcely cæspitose. *D. Carthusianorum* does not vary much in Russia, or we might have expected that a judiciously synthetical systematist, such as E. Regel of St. Petersburg, would have delimited the species in a way that he and Rohrbach have done with some of the eastern forms.

var. atrorubens All.—So named from the colour of the flowers; but as this is a very variable character in plants of the same species, the name is a bad one. It was, however, anterior to Jacquin’s homonym, so that the latter is the greater sinner. From its locality, this is probably the plant referred to by Paul Renealmus in 1611. Allioni thus diagnoses the plant in his ‘Flora Pedemontana’ of 1785:—“Flowers aggregate, bracts ovate, acute, shorter than the calyx”; and further, in the fuller description, “bracteiform (subfloral) leaves elliptical, with long glumes; bracts 4, pale, with reddish edges, and short glumes; lamina of petal purple-red, rhomboidal, teeth few and unequal, slightly pilose.” It is often found in the same localities as *D. sinensis* (*Sequieri*); and is indigenous on the French side of the Pyrenees. Introduced into England in 1802, and many varieties cultivated from it. Differs more from the type than Jacquin’s plant.

var. congestus G. et G.—So named from the disposition of the flowers. First described as a species by Boreau; occurs near Vichy, in the department of Allier, and near Molina, in the province of New Castile, among groves of oak.

var. vaginatus Vill.—First described in Villars’ ‘Flore du Dauphiné’ (1789): so named from the length of the leaf-sheath, which is four or five times the width of the leaf. It occurs between St. Flour and Mende, in the department of Lozère.

var. atrorubens Jacq.—This is also a Pyrenean variety, and differs in the following points from Allioni’s plant:—Stems 30 centim.; leaves more broadly linear; sheath purplish, three times as long as broad; inflorescence less congested, in capitula of 3–6 flowers; bracts broader, obovate, and ventricose.

Of the other thirty-one varieties given in my 'Enumeratio,' twenty-eight occur in Austria, many of them being reduced from species: the only province in which the species has not been recorded being Salzburg.

4. *D. barbatus* L.—Glaber. Caules 50 centim., simplices v. superne ramosi tetragoni. Folia lanceolata acuta plana 5-nervia; radicalia 44 mm., vagina folii diam. duplo longiore, caulinea 30 mm., vagina folii diam. æquante; subfloralia lanceolato-linearia. Inflorescentia fastigiis fasciculorum regulariter trichotomorum; floribus densis brevissime pedicellatis inodoris. Bracteæ 4 lanceolatæ acuminatæ ad calycis apices. Calyx apice attenuato, dentibus acuminatis. Petala contigua, lamina = $\frac{1}{3}$ unguis. Capsula oblonga.

var. aggregatus Poir.

F. (Æ. barbu). S. (C. de pom.). P. ? (mauritanias).

Geographical limits, 2360°.

N. Moscow (prov.), 55°.

S. N. China, 35°.

E. E. China, 120°.

W. Republic of Andorra, 2°.

Pre-Linnean references.—Earliest notice in 1461. In the 'Kruydeboek' of Dodoens, published in 1554, the specimens, which he describes in the old Flemish, in which the work was written, are probably garden forms: the two varieties are called "Keykens" and "tweede soorte van Keykens." The pseudogeneric name which is used by him in the 'Pemptades' (1616), viz., "Armerius," apparently includes the Linnean species *Silene Armeria* and *Lychnis flos-cuculi*, and which in the original Flemish are termed a fourth and fifth variety of "Keykens." The concordance of Linnean species with the plants of Dodoens can, however, only be conjectural. The Dodonæan plant which seems to tally best with Linnæus' description is the "tweede sorte van Keykens": the character of the "Keykens" itself is too flimsy to be at all reliable. The 'Kruydeboek' was translated into English by Lyte in 1578, and in this translation the plant is called *tol-me-neer*, which is the *tolmenier* or *colmenier* of the early herbalists. Was also described by Ruellius, and by Tabernæmontanus in his 'Kreuterbuch.' Among old scientific names may be mentioned:—

Lychnis monachorum hortensis (Conrad Gesner, circ. 1580).

Caryophyllus Carthusianorum (Tabernæmontanus, 1588).

Caryophyllus hortensis barbatus latifolius (Caspar Bauhin, 1596).

These old names indicate the early cultivation of pinks by the Carthusian monks. Dodoens' Latin name in his posthumous work of the 'Pemptades' (1616) is "Armerius flos alter." Forskahl (1736-1763), the Swedish traveller and pupil of Linnæus, found it in cultivation in Arabia, Egypt, and Greece; in the last country known by the vernacular name of "oussouvia," and in the patois of Lower Egypt, "gurumfil."

The plant was named from the very distinctly-bearded petals: and Poirët's variety from the disposition of the flowers, which are denser than in the Linnean species. The common English name of sweet-william is from the French *œillet*; and the French vernacular name is simply a translation of the scientific one.

Although mentioned in many local Floras, it is often only an introduction, or in a semi-naturalized condition, or an escape from cultivation; and, wide as is its distribution, it occurs only very locally, *e.g.*, in one district of Russia, and in the Pyrenees in Western Europe. It seems to be most truly indigenous in the provinces around the Adriatic littoral, from the heel of Italy to Corfu. Rohrbach unites with this plant Thunberg's *D. japonicus*, but *D. barbatus* differs from it in the following points:—Stems 4-angular, and sometimes branched above; leaves lanceolate, plane, and not contorted at the base, 5-nerved; sheath of the radical leaves twice as long as broad; fascicles fastigate; flowers of a darker red, denser, and consequently on shorter pedicels; bracts very scarious, lanceolate to the apices of the calyx; calyx contracted at the base of the purple teeth; petals broader, obovate-cuneate; and capsule oblong. So that they seem as different as any two pinks can well be. An experiment of Darwin's further illustrates the distinction. In his investigations into the power of mutual cross-fertilization of the commoner pinks, he found that if the flower of *D. barbatus* was fertilized by the pollen of *D. superbus*, it yielded a proportional 81 seeds, when fertilized by the pollen of *D. japonicus* a proportional 66 seeds, relatively to the 100 seeds produced by its own pollen. Mr. Hemsley is inclined to believe that it is not indigenous in China; and Fischer's Japanese *D. cruentus* is only a cultivated form of the wild species, or an hybrid. While speaking of hybrids, we may record the dictum of Fries-Morel, who assures us that the hybrids of *Dianthus* resemble their mother in form, and their father in colour. They usually vary less in the species and varieties of the first generation, the less the degree of affinity between their parent-forms, species-hybrids therefore less than variety-hybrids; the former are often characterized by a greater uniformity, the latter by a greater variability. When hybrids are self-fertilized, the variability increases in the second and succeeding generations the more completely it was absent from the first; and these different varieties arise more certainly the less the affinity between the parent-forms. There was a fair specimen of the hybrid *barbato-alpinus* in the rockery at Kew, in June 1889, with dark red, rose-coloured, and white flowers. In the grounds of Earl Kilmorey, at Isleworth, there was, in June 1884, a curious monstrosity with the leaves more or less united either on one or both sides.

Introduced to English gardens from the Low Countries, and carried by the early colonists to North America. In the Peninsula it grows on hilly pastures and the green slopes of mountains.

Subsectio 3. MACROLEPIDES.—Bracteæ 4 ovatæ patentēs.

5. *D. crassipes* Roem. — Pubescens. Caules 58 centim., simplices teretes stricti. Folia stricta adpressa; basilaria

62 mm., 7-nervia acuta, reliqua 50 mm., 5-nervia acuminata, vagina folii diam. duplo longiore, subfloralia elliptica late membranacea. Inflorescentia corymbosa; fasciculis plerumque 2, florum 2—30 inodororum. Bracteæ 2 exteriores ad dimidium calycem acutæ, 2 interiores ad calycis apices acuminatæ. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua barbulata; lamina obovato-cuneata, = $\frac{1}{2}$ unguis.

S.

Geographical area.—Andalusia.

Willkomm identified Roemer's original plant, amplified its description, and clearly defined it, and at the same time retained the specific name, which it owes to the stout and woody rootstock.

Roemer does not mention whether the petals are bearded, and in the dried specimens it is impossible to ascertain. There are generally two capitular fascicles on short peduncles; when a third is present, it is borne on a longer peduncle springing from the penultimate node. The teeth of the calyx, as well as the apices of the bracts and subfloral leaves, are purplish. It is found on sandy ledges and rocks of the graywacke formation of the Sierra Morena, at an elevation of 600–900 metres.

6. *D. Girardini Lam.* — Glaber. Caules 50 centim., simplices v. superne ramosi teretes. Folia lanceolata acuminata plana 5-nervia, 35 mm., subfloralia lanceolato-linearia, vagina folii diam. æquante. Inflorescentia cymis regulariter trichotomis; floribus laxis inodoris. Bracteæ mucronulatæ ad calycis apices. Calyx dentibus lanceolatis-acuminatis. Petala contigua barbulata, lamina = $\frac{1}{2}$ unguis.

F. (Æ. de Girardin).

Geographical area.—Central France.

Essentially distinct from *D. barbatus* by its mode of inflorescence: the secondary and tertiary axes are lengthened and branched in a regular trichotomy, in which the last branchings are terminated, the central by a single flower, the lateral by two flowers. It also differs in the form and structure of the bracts. Lamotte cultivated it for some years from seed, without any modification occurring in its specific characters. Extrinsically it is similar to the Austrian *D. compactus*.

7. *D. toletanus B. et R.* — Suffrutescens, glaucus, scaber. Caules stricti 25 centim. furcati tetragoni. Folia acuta stricta plana adpressa, radicalia 24 mm. 5-nervia, caulinea 20 mm. 3-nervia, summis abbreviatis, vagina folii diam. æquante. Flores subfasciculati fere sessiles cymis laxis. Bracteæ mucronatæ ad dimidium calycem, subherbaceæ. Calyx apice attenuato, dentibus mucronatis 11-nerviis. Petala non contigua barbulata, lamina obovato-cuneata, = $\frac{1}{2}$ unguis.

S. (C. de Toledo). P. (C. de Toledo).

Geographical limits.

N. Mountains of Castile.

S. Sierra Morena.

E. Eastern boundary of Castile.

W. Sierra d'Estrella.

The plant is named from Toledo, in the province of Castile. But for the characteristically distinct bracts, it might be considered a Spanish form of *D. capitatus*. First record by Reuter in 1841, on rocky soil at an elevation of 800 metres above the sea.

8. *D. anticarius* B. et R. — Suffrutescens, glaucus, pubescens. Caules stricti 50 centim. simplices v. furcati tetragoni. Folia acuta stricta plana adpressa omnino 5-nervia, radicalia 40 mm., caulinea 33 mm., summis abbreviatis, vagina folii diam. duplo longiore. Flores cymis laxis. Bracteæ acuminatæ ad dimidium calycem, subherbaceæ. Calyx dentibus acutatis 11-nerviis. Petala non contigua imberbia, lamina obovato-cuneata, = $\frac{1}{3}$ unguis.

S. (Clavellina de Antequera).

Habitat.—Sierra de Antequera, prov. Cordova.

First recorded by Reuter in 1849, on rocky pastures and hilly places at the southern base of Sierra de Antequera, on calcareous soil, at an elevation of 1000 metres above the sea. The specific name is latinized from its habitat.

Subgenus II.—CARYOPHYLLASTRUM.

Sectio FIMBRIATUM.

Subsectio 1. SCHISTOSTOLON.—Caules ramosi, glabri.

9. *D. mouspessulanus* L. — 44 centim. Caules teretes. Folia plana acuminata patentia stricta 5-nervia, radicalia 62 mm., caulinea 53 mm., vagina caulis diam. æquante. Flores solitarii aut 2—3 aggregati, speciosi inodori. Bracteæ 4 ovatæ acuminatæ ad dimidium calycem adpressæ. Calyx apice attenuato, dentibus lanceolatis acuminatis 7-nerviis. Petala contigua barbulata, rosea rarius alba.

F. (E. de Montpellier). S. (Clavel de Montpellier, *scientific*; Clavellina deshilada, *Castilian*; Clavell del pastor, *Catalan*; Chulufrina, *Basque language*).

Geographical limits, 392°.

N. Hungary, 47°.

E. Caucasus, 48°.

S. Calabria, 40°.

W. Corunna, in Spain, 8°.

Pre-Linnean name. — Caryophyllus floribus solitariis, petalis multifidis basi canaliculatis (*J. G. Gmelin*, 1751).

Described by Linnæus from specimens found in the vicinity of Montpellier (hence the name). It was in this city that Antoine

Laurent de Jussieu resided while elaborating his system of the natural classification of plants, which, however, was not published till 1789. Called "monspeliacus" in Gouan's 'Hortus Monspeliensis' (1762), and = "Tunica arenaria" of Scopoli.

It grows with the utmost vigor on volcanic soils in France, but it also flourishes on primitive and calcareous soils. Its stations are often at an elevation of 1000–1200 metres; at Royat, in the Auvergne, at 600 metres; on the Mt. Dore at 1500 metres. In fact, it is found from the plain to the snow-line on the argillaceous schist and the calcareous rocks of mountains. In the north and east of Spain it is found on the dry outskirts of woods and hilly pastures.

Linnæus ascribes to his plant, "Squamas . . . patulas longitudine calycis apice fusciscentes." In the usual descriptions of the species in the Floras of Western Europe, the bracts are described as reaching to half the length of the calyx, and herbaceous: as this is the case in the living plant also, we can only presume that his specimen was a bad one, or that the dried condition of his plant led him to make a slight error as to the usual length of the bracts. In his 'Catalogue of Pyrenean Plants,' published in 1826, Bentham has the following note (in French) under *D. superbus*, which, however, probably refers to *monspessulanus*:—"In the Pyrenees I have seen only one species of *Dianthus* with fimbriate petals. It varies in the length of the bracts, sometimes not reaching as far as the middle of the calyx-tube, and sometimes longer, until it may possibly exceed it slightly in length. The petals are also very variable in size, always more or less pilose. I have especially noticed these variations in pastures in the environs of Benasque, where this species is very abundant." Many botanists who have studied the Pyrenean flora believe that those forms usually ascribed to *D. superbus* should be referred to this species, and that the former does not really occur in Spain at all (*Philippe*, 'Flore des Pyrénées'; *Willkomm and Lange*, 'Prodromus Floræ Hispanicæ'; *Colmeiro*, 'Plantas de la Peninsula Hispano-lusitana e I. Baleares'; *Graells*). *Philippe* says that between Bayonne and Perpignan, from one end of the Pyrenees to the other, this plant varies considerably; and that when the station of the plant has a south aspect, it possesses an agreeable odour, but when exposed to the north this fragrance is not apparent.

The city of Montpellier honours the memory of the Jussieus, and a worthy inheritor of the *genius loci* in the person of the illustrious Planchon there carries on his researches into the affinities of plants.

As to the degree of incision of the petals which should place a plant among the fimbriate species, I think no sharp line can be drawn. They should certainly include those whose petals are incised half-way or more from the margin to the throat, probably also all those with the lamina incised to one-third of its depth. In those that are not so deeply incised we have to consider the relative length and breadth of the teeth or fimbriæ themselves, apart from the undissected intermediate area, and the degree of their acumination. In cases of doubt we might take into consideration

characters which link the two more important subgenera, *viz.*, in this one in which *D. monspessulanus* is placed, the more frequent absence of a beard at the junction of the lamina with the unguis and the more conspicuous showiness of the flowers, in the preceding the closer apposition of the flowers, their less specious character, and the frequent presence of a beard. As to the delimitation of absolute specific forms, I am unable to indicate any clearly-definite lines. The most that one can attempt to do in such a genus as *Dianthus* is, with the accumulated materials at hand, to group the numerous and apparently fluctuating forms into more or less imperfectly defined species. In discussing the affinities of certain closely allied genera, Boissier tersely expressed the obvious difficulties of satisfactory discrimination in speaking of "characteres valde liquidi"; and this charitable phrase should cover a multitude of failings in the tangled web of affinities.

10. *D. marsicus* *Ten.*—31 centim. Caules teretes. Folia canaliculata acuminata adpressa stricta 3-nervia, radicalia 58 mm., caulinia 48 mm., vagina caulis diam. æquante. Bracteæ 4 ovatæ acuminatæ ad dimidium calycem adpressæ. Calyx dentibus lanceolatis acuminatis 7-nerviis. Petala non contigua barbulata, rosea rarius alba.

F.

Geographical limits.

W. S. France.

E. Central Italy.

Of slenderer habit than the preceding, growing on hilly pastures.

11. *D. Waldsteinii* *Strnb.* — 50 centim. Caules teretes. Folia plana acuminata patentia flaccida 5-nervia, radicalia 53 mm., caulinia 48 mm., vagina caulis diam. æquante. Bracteæ 4 ovatæ acuminatæ ad calycis apices patentès. Calyx apice attenuato dentibus lanceolatis acuminatis. Petala non contigua imberbia.

F. (Æ. de Waldstein).

Geographical limits, 80°.

N. Noric Alps, in Styria, 47°.

E. West Servia, 20°.

S. Principality of Montenegro,

W. Department of Hautes Py-

48°.

renées, 0°.

Named after Waldstein, an Austrian botanist. Is essentially a mountain plant, occurring at high altitudes, and requiring a drier soil than the two preceding. There are specimens in the Kew Herbarium from Eaux Bonnes, in the Pyrenees, which marks its western limit. It is, moreover, distinguished by its hardier habit, shorter radical leaves, beardless petals, and the bracts reaching to the apices of the calyx-teeth or beyond.

12. *D. saxatilis* P. — 20 centim. Caules teretes. Folia canaliculata acuminata adpressa 3—5-nervia, vagina folii diam. æquante. Bracteæ 4 obovato-lanceolatæ mucronulatæ ad $\frac{1}{2}$ calycis, adpressæ. Calyx dentibus lanceolatis acuminatis. Petala contigua imberbia, lamina obovato-cuneata.

F.

Geographical area.—Languedoc and Lower Austria.

Derives its name from its occurrence on rocks. Some of the French botanists consider it an hybrid; it is certainly found in the same districts as *D. monspessulanus*. Recorded by Halácsy in Lower Austria. Very similar to the Armenian *D. floribundus*, but the petals are more deeply incised.

13. *D. Sternbergii* Sieb. — Cæspitosus, glaucus. Caules 26 centim. biflorales 4-angulares. Folia acuminata patentia plana, radicalia 55 mm. 5-nervia, caulinea 38 mm. 3-nervia, vagina folii diam. æquante. Bracteæ 4 obovatæ mucronatæ ad $\frac{1}{2}$ calycis. Calyx dentibus lanceolatis acuminatis. Petala non contigua barbulata, lamina obovato-cuneata.

F. (Æ. de Sternberg).

Geographical limits, 161°.

N. Mt. Jura, in Switzerland,	S. Sierra d'Estrella, in Portugal,
47°.	40°.
E. The Noric Alps, in Carinthia,	W. Sierra d'Estrella, in Portugal,
15°.	8°.

Named after the botanist Sternberg. Is essentially a mountain plant, occurring at high altitudes, and requiring a very dry soil. Grows in rocky and gravelly places on a calcareous soil.

14. *D. serrulatus* Desf. ('Flora Atlantica,' i., p. 346, 1798).—40 centim. Caules tenues 4-angulares. Folia plana; radicalia 64 mm. 7-nervia, acuta, caulinea 30 mm. 5-nervia, acuminata; vagina folii diam. æquante. Bracteæ 8 lanceolatæ acuminatæ ad $\frac{1}{2}$ calycis patentes. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua barbulata, lamina obovato-cuneata.

S. (C. del campo).

Geographical limits, 160°.

N. Andalusia, 38°.	S. Algeria, 30°.
E. Tunis, 10°.	W. Morocco, 10°.

So named by Desfontaines, from the incised margin of the petals. The plant is not to be confounded with Schlosser's homonym, which is a Croatian species, and which differs from this North African plant in the following points:—Cæspitose in habit; stems much shorter, simple, and angularly compressed, with the angles more acute than

in the other; leaves plane, with the sheath twice as long as broad; bracts 4, more broadly ovate and reaching to the apices of the calyx, thinner and more membranous in texture; and teeth of the calyx reddish. The only station in Europe is that of the calcareous cliffs on Sierra Nevada. By priority of nomenclature this name should stand, and some other be found for Schlosser's species.

15. *D. valentinus* Willk.—*Cæspitosus*. Caules 50 centim. dichotome ramosi fastigiati stricti teretes inferne angulati. Folia plana adpressa acuta 3-nervia, radicalia 52 mm., caulinea 48 mm., vagina folii diam. æquante. Bracteæ sæpissime 6 obovato-lanceolatæ mucronatæ ad dimidium calycem. Calyx apice attenuato, dentibus lanceolatis subulatis. Petala non contigua barbulata, laminâ speciosâ = unguem.

S. (*C. famosa*). P. (*C. soberba*).

Geographical area.—Spain and N. Portugal.

N. R. Ebro.

E. Tortosa, in Catalonia.

S. Malaga.

W. N. Portugal.

First recorded in prov. Valencia (hence the name), when it was referred to *D. superbus*, but, on comparison, found to be distinct. Perhaps a western form of *D. fimbriatus*, to which it is very similar. Grows generally at the base of hills, and in glades. It must be admitted that constant specific characters are not very well marked.

Subsectio 2. CYCAXOSTOLON.—Caules simplices teretes.

16. *D. fallens* Timb. (Obs. *Dianthus* Pyrénées). — Glaber 20 centim. Folia rigida falcata; radicalia obtusa 5-nervia, caulinea acuminata 3-nervia 25 mm., vagina folii diam. æquante. Bracteæ 4 interiores obovato-lanceolatæ, exteriores lanceolatæ, mucronatæ ad dimidium calycem. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala contigua barbulata.

S. F.

Geographical limits.

N. Pyrenees, 42° 50'. W. R. Aragon, 0° 50'.

S. R. Ebro, 41° 20'. E. Republic of Andorra, 1° 40'.

The specific name is derived from Lat. *fallere*, adj. part. *fallens* = *deceiving*, hence *ambiguous*: for similarly expressive name cf. Panicé's *D. ambiguus*. First record in 'Bull. Soc. Botanique de France,' v., p. 329 (1858). Occurs in rocky places among the Pyrenees, on the Spanish side; probably also on the French side: if so, is included by Grenier and Godron under *D. tener*.

17. *D. fimbriatus* M. B. (mihi, sensu latiore; 'Flora Taurico-Caucasica,' i., p. 332, 1808). — Suffrutescens, glaber.

Folia linearia acuta adpressa. 3-nervia, plana v. canaliculata. Bracteæ variabiles 4—12, ovali- v. oblongo-lanceolatae, $\frac{1}{2}$ calycis longit. coriaceæ v. stramineæ. Calyx apice attenuato, dentibus lanceolatis acuminatis 7-nerviis. Petala barbulate non contigua, formâ variabilia.

var. mucronulata miki.—Cæspitosa, glauca. Folia rigida. Bracteæ 8 suborbiculares mucronulatæ. Calyx apice non attenuato. — Herb. Kew. ex Hispania, et Herb. Mus. Brit. ex hb. Graells. (= ?? *D. Broteri*).

var. sclerophyllus Willk.—Cæspitosus glaucus. Folia coriacea. Bracteæ 8 lanceolatæ. Calyx apice attenuato.

var. brachyphyllus Willk.—Cæspitosus glaucus. Folia radicalia linearia breviora. Bracteæ 8 lanceolatæ. Calyx apice attenuato.

var. leptophyllus Willk.—Cæspitosus glaucus. Folia radicalia anguste linearia. Bracteæ 8 lanceolatæ. Calyx apice attenuato.

var. macrophyllus Willk.—Bracteæ 6. Lamina = unguem.

F. S. (Clavelitos, *Castilian*; Clavell del campo, *Catalan*). P.

Area of distribution, 1428°.

N. Caucasus, 42°.

E. West Tibet, 76°.

S. Scinde, in Hindostan, 25°. W. Portugal, 8°.

Caryophyllus montanus major (*Grisley*, 1661).

Derives its name from the segmentation of the petals. I can see no reason whatever for separating this plant of the Caucasian Iberia from Boissier's plant of the other (western) Iberia. They are both extremely variable and typically polymorphous species. The specific type, in the broader sense, is very widely distributed; in Spain, Portugal, Morocco, Algeria, and the Caucasus, and in the east from the Levant to West Tibet and Scinde: growing on dry hills, rocky places, and sandy slopes.

Let us review in their order the more constant characters. All the forms are suffruticose at the base, where the rootstock is vertical or oblique, dividing into many branches producing stems and leafy shoots. The growth of the leafy shoots is generally vigorous, giving the plant a cæspitose habit: this is more marked in the Spanish and North African forms, probably from the habitat. The stems are terete, simple, and frequently unifloral, though they may be forked near the base, strict, slender, and erect or ascending from the crown of the rootstock, and usually fastigate and equal in height. The leaves are generally glaucous, though in very high stations this glaucescence is absent; they are linear, adpressed, and 3-nerved (with the nerves very prominent on the under surface), and vary considerably in length; the margins are scabrous and bordered with the lateral nerves, and the length of the leaf-sheath is equal to or twice its breadth. The bracts vary considerably in form, number, and texture, even in the same localities. In the

typical forms there are four pairs (or five, with the lowest pair foliaceous) closely applied along one-third the length of the calyx, oval, or oblong-lanceolate and mucronulate, with the nerves distinctly prominent. The calyx is generally contracted above, with the teeth 7-9-nerved and ciliolate, and is sometimes as long as 30 mm. The lamina of the petal is large and bearded, though in some of the western forms this capillary outgrowth is slight, and almost evanescent. The capsule is oblong, substipitate, and slightly exserted.

Willkomm's varieties are based upon the differences in the character of the leaves; the last-named grows in thickets, the others in gravelly places exposed to the sun. Among the non-fimbriate species the forms of this polymorphic plant seem to approach *D. sabuletorum* of the beardless species, and *D. lusitanicus* of the bearded ones.

18. *D. gallicus* P.—Pubescens, glaucus, gracilis, 25 centim. Folia 18 mm. 3-nervia, obtusa plana incurva, vagina folii diam. æquante. Bractæ 4 obovatæ mucronatæ ad $\frac{1}{4}$ calycis partem adpressæ. Calyx apice attenuato, dentibus lanceolatis acuminatis 9-nerviis. Flores rosei aut albi, odorati. Petala contigua imberbia, lamina subrotunda, = $\frac{1}{3}$ unguis.

var. *lusitanus* Sjögr.—Folia rigida stricta; vagina rubella.

F. (Æ. français). S. P. (C. de Francia).

Geographical limits, 63°.

N. Dept. of Finisterre, 48°. E. Dept. of Gironde, 0°.

S. R. Douro, 41°. W. Oporto, 9°.

First recorded on the west coast of France: hence the name. Like *D. liburnicus*, it is one of the few maritime species. First found in Portugal by P. T. Webb, in 1838, in pine-woods on the west coast. This botanist did not give it a distinct varietal name, but it is the var. *lusitana* of Nyman's 'Conspectus.' From its habitat described by Thore under the name of "*D. arenarius*."

Subsectio 3. MONERESTOLON.—Caulis unicus ramosus in multos cauliculos glabros. Folia patentia recurva. Petala barbulata, non contigua.

19. *D. superbus* L. — Caulis dichotome ramosus 35—38 centim. teres. Folia lanceolato-linearia basi obtusa superne acuta mollia plana 3—5-nervia, vagina folii diam. æquante. Inflorescentia paniculis laxis dichotomis florum roseorum odoratorum. Bractæ 4 mucronatæ ad $\frac{1}{4}$ calycis partem obovatæ stramineæ, adpressæ. Calyx apice attenuato, dentibus lanceolatis acuminatis.

H. G. (prächtige N.). F. (Æ. superbe). S.

Geographical limits, 5700°.

N. Altenfiörd, in Norway, 70°. S. Barcelona, 42°.

W. Galicia, in Spain, 8°. E. Japan, 142°.

Caryophyllus minor, II. (*Dodonæus*, 1583).Caryophyllus sylvestris, VI. (*Clusius*, 1598).Superba major flore albo (*G. Pelletier*, 1610).Tunica montana altissima (*Rupp*, 1718).Tunica plumaria (*Scopoli*, 1760).Caryophyllus superbus (*Moench*, 1744–1805).Caryophyllus flore tenuissimo dissecto (*Sequier*, *Plantæ Veronenses*, 1745–1754).Caryophyllus floribus solitariis, petalis multifidis basi canaliculatis (*J. G. Gmelin*, 1751).Caryophyllus plumarius (*Kraschenninikow*, 1750).

This species is indigenous in Holland, and naturalized in Belgium, having been introduced into the latter country in 1596. The earliest notice is in the original edition of Dodoens' '*Kruyde-boeck*,' published in 1554, where it is described by the old Flemish name of "Ander gedaente van Pluymkens" = "a second kind of *Pluymkens*"; the first kind referring to *D. plumarius*, which was in early cultivation in the Low Countries. In the later edition of the '*Pemptades*' of 1616, it is called "*Caryophyllus minor alter*."

The species was so named by Linnæus on account of its intrinsic beauty. As *D. cæsius* is the characteristic English pink, so is this essentially the French pink (more so than the preceding, whose geographical area is very limited). If Nature has many species which herald the return of spring, she keeps a few in reserve for the shadows of autumn. For it is at the fall of the year that this superb *Dianthus* decks the glades of the forest, and exhales the fragrant perfume from its delicate petals. In the various stations at which it occurs, seems to prefer the calcareous to primitive rocks, growing in thickets and on grassy banks. In the course of the development of the dichotomous panicle, the central division constantly aborts, absorbed by the growth of the lateral prongs; and this phenomenon, like that which is shown in the constant abortion of lateral shoots, is seen throughout the genus, in the species with this mode of branching; whilst in *Silene*, where the branching of the stems resembles that of the pinks, the central shoot grows and is developed like the three prongs in *Fraxinus*. Willkomm is not disposed to credit its indigeneity in Spain, but thinks that the specimens so referred by Spanish botanists are rather to be referred to *D. monspessulanus*: but the Italian vernacular name of *garofanini di Spagna* would appear to contra-indicate this. Colmeiro's specimens were found on the grassy slopes of meadow-land in Galicia, which station (it should be noted) is the western limit of the plant in Europe. It seems so very distinct from the other European forms, that it has been thought well to place it apart in a subsection with the Swiss *D. Wimmeri* (which some would consider a variety) and an Eastern

form from Mt. Lebanon. Timbal-Lagrave, in his essay on the Pyrenean Pinks, also emphasizes its distinctiveness.

Sectio BARBULATUM.

Subsectio 1. LEPIDACRIBIA.—Bracteæ scariosæ, atting. $\frac{1}{4}$ — $\frac{1}{3}$ calycis longitudinem.

20. *D. lusitanicus* Brot.—Suffrutescens, cæspitosus, glaucus, glaber. Caules teretes furcati, 30 centim. 2—4 flori. Folia acuta canaliculata 3-nervia, radicalia 19 mm. carinata patentia recurva, caulinia 10 mm. stricta adpressa, apicem versus cucullato-convoluta, vagina folii diam. æquante. Flores longe pedunculati, inodori, supra rosea infra pallida. Bracteæ 6 mucronatæ. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua, lamina = $\frac{1}{3}$ unguis. Capsula dentibus obtusis.

S. (C. sylvestres). P. (C. de Lusitana).

Geographical limits, 35°.

N. R. Douro, 41°.	E. Aragon, 1° W.
S. Cadiz prov., 36°.	W. Portugal, 8°.

Derives its name from *Lusitania* = Portugal, cf. *Lusiads* of Camoens. It occurs in the central and southern parts of the Iberian peninsula, chiefly on granitic, micaceous, and sandy cliffs, often at an elevation of 1000 to 1050 metres. Is the plant referred to by Grisley in his 'Viridarium' (1661), by the name of "Caryophyllus montanus minor elegans," which would also include *D. attenuatus*, with which it has been so often confounded. First described in the 'Flora Lusitanica,' vol. ii., p. 173 (1804), and figured in the same author's 'Phytographia.' But for the bearded petals, might be associated with *D. attenuatus*, as the authors of the 'Flore de France' have done. It is somewhat variable in the comparative size of its different parts, in the relative length of the leaves, stems, shoots, and branches of the rootstock. On the dry calcareous soil of the southern part of Saragossa is found a dwarfed form with small flowers.

21. *D. cæsius* Sm.—Cæspitosus, glaber, glaucus. Caules 22 centim., simplices v. superne furcati stricti 4-angulares. Folia 3-nervia patentia, radicalia 50 mm. obtusa plana, caulinia 36 mm. acuta carinata, vagina folii diam. æquante. Flores speciosi odorati. Bracteæ 4 obovatæ mucronatæ. Calyx dentibus ovato-lanceolatis acutis. Petala contigua, lamina obovato-cuneata, = $\frac{1}{2}$ unguis.

E. (Cheddar or Mountain P.). F. (Æ. bleuâtre). G. (Graugrüne N.). B. (Blauwachtige A.).

Area of distribution, 96°.

N. Somerset, 51°.

S. Dauphiny, 45°.

E. Pilsen, in Bohemia, 13°. W. Somerset, 3°.

Armeria species flore in summo caule singulari (Ray, 1670).

Tunica rupestris folio cæsio molli flore carneo (Dillenius, 1732).

Ray seems to base his name on the unbranched unifloral stems; Dillenius selects its glaucous habit, the texture of its leaves divergent from the stem, the colour of the flowers, and its rocky mountain station. Referred to by Hudson as "*D. glaucus*" (1762). This is *par excellence* the English Pink. It is not a Linnean species, as stated in Sowerby's 'English Botany' (3rd edition), but was described by Smith in his 'English Botany,' tab. 62 (1792), and also referred to two years later (1794) in his Synopsis of the genus in the 'Transactions of the Linnean Society.' The specific name *casius* refers to the grey-green appearance produced by the deposit of bloom on the leaves, and is used in the same sense as "*glaucus*" and "*pruinosis*" of many authors, though the last would rather indicate a more frosted, heavier deposit of white bloom.

Its geographical distribution is extremely limited, and the only British locality for the plant is the Cheddar Cliffs, consisting of abrupt limestone precipices in Somerset. This solitary station should therefore be jealously guarded, being, as it is, the northern as well as the western limit of the plant in Europe. It is not very plentiful, and fortunately not very accessible, even at this one station, where it grows at a height of 50 ft. among jagged rocks; and unless visitors forbear to take away specimens, it will soon become extinct as a native British plant. If they require mementoes, they might wreak their *cacoethes prehendi* on *Dianthus deltoides*, which grows hard by.

In the east of France and Switzerland it is essentially a mountain pink, and reaches an altitude of 1500–1800 metres: often found in association with *Saxifraga aizoides*, *S. hypnoides*, and *Cerastium alpinum*. When it is found at a lower elevation, it is from the seeds being washed down by rains, &c. In North Italy it is called "*garofano appannato*."

The rootstock has long, slender divisions, producing ascending, short, barren shoots, which give the plant a cæspitose habit, and many erect or ascending unbranched flowering stems; the bracts are membranous, with an herbaceous apex. The flowers are 1 in. in diameter, with the teeth of the petals one-eighth to one-sixth the length of the lamina, and, as Smith says, "delightfully fragrant, of a delicate, pale rose-colour." It may be noticed that the highest pair of leaves are adpressed to the stem, and much shorter, thus approaching the bracts in character.

Subsectio 2. HEMISYRHX.—Bracteæ atting. $\frac{1}{2}$ calycis longitudinem.

22. *D. deltoides* L. — Cæspitosus, pubescens. Caules 25 centim. furcati tenues. Folia plana patentia flaccida 3-nervia,

radicalia oblanceolata obtusa, caulinia lineari-lanceolata acuta, suprema squamiformia fere scariosa, vagina folii diam. æquante. Flores breviter pedunculati odorati. Bracteæ 2 (rarius 4) ovatæ acuminatæ. Calyx gracilis, dentibus lanceolatis acuminatis. Petala non contigua, laminâ obovatâ roseâ v. purpurascente, = $\frac{1}{2}$ unguis.

var. *glaucus* L.

var. *microlepis* Pet.

E. (Maiden P.). F. (Æ. deltoïde). H. B. (Dryhoekige A.). G. (Delta-blumige N.). S. (Clavellina deltoïdea). P.

Area of distribution, 6027°.

N. Norway, 64°.

E. Japan, 142°.

S. Bengal, 23°.

W. Scotland (Inverness), 5°.

Pre-Linnean references.—Earliest record in 1581, in which year Lobel published his 'Kruydtboek,' and gave a drawing of it: not mentioned by Dodoens, either in the 'Kruydeboek' or 'Pemptades.' It is referred to again, sixteen years later, in Gerarde's 'Herball,' where he says:—"There is a wild creeping pink which groweth in our pastures near about London and in other places, but especially in the great field next to Deptford by the path side as you go from Redriffe to Greenwich, which hath many small tender leaves shorter than any other of the wild pinks, set upon little tender stalks, which lie flat upon the ground, taking hold of the same in sundry places, whereby it greatly increaseth, whereupon grow little reddish flowers. The root is small, tough, and long lasting."

Armeria sylvestris (Lobel, 1581).

Caryophyllus simplex supinus latifolius (Caspar Bauhin, 1596).

Caryophyllus sylvestris (Chusius, 1598).

Caryophyllus minor repens nostras (Ray, 1670).

Armeria species flore summo caule singulari (Petiver, 1702).

Tunica ramosior (Dillenius, 1732).

Other pre-Linnean botanists also refer to the plant by one of these names. The species is so named from the resemblance of the marking of the lamina of the petals to the Greek letter *delta*. An old English name for it is "Sop-in-Wine."

It has a very wide area of distribution. The most northern record for the plant is Levanger, on the Trondhjem fiord, in Norway, lat. 63° 52', vide A. Blytt's 'Norges Flora,' p. 1073. The southern limit is Bengal. Franchet and Savatier record its eastern limit in Japan, in whose Flora it had also been previously described by Siebold and Miquel. The western limit is in the west of Scotland: in Watson's herbarium at Kew there is a specimen (dated 1833) from Cromwell's Mount, Campbelltown, in Inverness. It grows in all the countries of Europe, with the exception of Turkey and Greece; though it is not recorded from Sardinia, or from Ireland.

This pretty pink is found on grassy slopes, road-sides, and dry pastures: it flourishes on soils of primitive or volcanic origin, e. g.,

in France on the syenite of the Vosges, on the basalt of Auvergne, in Spain in the subalpine districts of the mountains of Castile, and in England on dry meadow-land in East Anglia. It reaches high up mountain-sides; DeCandolle mentions 1600 metres in the Pyrenees. In the eastern counties of England it flowers in the third week in June. In ordinary specimens the flowers are 16 mm. long, 18 mm. across, and there may be as many as five on a stem: the petals vary in the depth of the rose-colour with a few white spots, and have a crimson band at the base (the latter is present even in the white variety). The plant grows in lax tufts, and is usually only slightly glaucous. The early red pinks of the florists, in the opinion of many horticulturists, have probably sprung from this species.

A peculiar fact to notice here is the phenomenon of *gynodioecism*, which seems rather common in the genus, as in the proterandrous *Alsineæ*. It occurs in *D. superbus* and *Carthusianorum*; and *D. deltoides* shows all gradations between hermaphrodite, gynomonœcious, and gynodioecious flowers.

23. *D. gaditanus* Boiss.—Glaber. Caules ramosi teretes. Folia acuta plana stricta, vagina folii diam. æquante. Flores irregulariter corymbosi rosei. Bracteæ 4—6 ovato-oblongæ mucronatæ adpressæ. Calyx apice attenuato, dentibus lanceolatis mucronulatis 9—11-nerviis.

S. (C. de Cadiz).

Geographical area.—Cadiz prov.

So called from the ancient town of *Gades*, founded by the Phœnicians, and situated on an island of the same name, separated from the mainland by a narrow channel. Herodotus says that the island of Erythia was close to Gadeira; whence many writers supposed the island of Gades to be the same as the mythical island of Erythia, from which Hercules carried off the oxen of Geryon.

Subsectio 3. LONGISQUAMEA. — Bracteæ calycem æquantes longitudine.

24. *D. glacialis* Hke. — Cæspitosus, glaber. Caules 10 centim. simplices 4-angulares 1—2-flori. Folia radicalia lineari-lanceolata obtusa plana trinervia patentia, caulinea 36 mm. linearia acuta patentia stricta aut recurva, vaginâ folii diam. duplo longiore. Bracteæ 4, exteriores lanceolatæ, interiores ovatæ, patentes. Calyx dentibus obtusis triangularibus. Petala contigua, laminâ = unguem.

var. neglectus Lois. (= *D. glacialis* Gaud. in Fl. Helvetica).

var. alpinus Vill. (in Pl. Dauphiné, iii., p. 600, non L.).

F. (Æ. des glaciers). S.

Geographical limits, 150°.

N. The Carpathians, in Galicia, 48°. S. The Pyrenees (Spanish side), 42°.

E. Transsylvania (county of Hermannstadt), 25°. W. The Pyrenees (central), 0°.

A wonderful hash of names and plants has occurred here, and as Sir J. E. Smith said, "the chief source of confusion has been the incorrect labours of authors." *D. alpinus*, *glacialis*, *neglectus*, *gelidus*, *subalpinus*, *alpestris*, &c., have been inextricably mixed up together; and the shortest way to disentangle them is to go straight to the plants themselves and re-describe them, without regard to the differences as they exist "on paper": and this is a case in which the law of priority in nomenclature should not be too strictly applied. One man may have meagrely and incorrectly described a dried specimen, and another may have described later on a specimen from the same spot more fully, and may have bestowed upon it another name. Which name ought to stand? Why, I should say, that given by the man who understood most about the plant. The *baptism* of a plant does not so far sanctify it as to preclude subsequent condemnation, especially when performed in an unorthodox fashion.

SECTIO CARYOPHYLLUM.

Subsectio 1. CARYOPHYLLOIDES. — Species typicæ. Folia patentia. Calyx dentibus acuminatis. Capsula ovoidea.

25. *D. Caryophyllus* L. — Cæspitosus, glaucus, glaber; anno secundo, rhizomate turiones atque stolones repentis foliorum fasciculo terminatos caulem floriferum producentes edente. Caules 60—70 centim. apicem versus paniculato-ramosi (raro simplices) plus minus angulati valde nodosi. Folia crassa obtusa canaliculata 5-nervia, nervo centrali prominente lateralibus invalidis, marginibus vix scabridis: radicalia 92—98 mm. longissima, caulinea 70—75 mm. linearia recurva, superne decrescentia, summis bracteis formibus, vaginâ folii diam. duplo longiore. Flores solitarii speciosi odoratissimi dimorphici, rosei purpurei aut albi, longe pedunculati. Bracteæ 4, obovatæ vel fere obcordatæ, acumine mucronato herbaceo ad $\frac{1}{4}$ calycis longitudinem, coriaceæ, marginibus lævibus. Calyx 24 mm., apice attenuato, dentibus lanceolatis acuminatis 9-nerviis, marginibus scabridis. Petala contigua, lamina obovato-cuneata truncata inæquali-dentata, = $\frac{1}{2}$ unguis. Stamina stylis longiora v. breviora.

var. *genuinus* L. 'Species Plantarum,' ed. 1, p. 411.

var. *Scheuchzeri* Jord. — Laxe cæspitosus. Petala non contigua.

var. *collivagus* Jord. — Vix cæspitosus. Habitu minor.

var. *carduinus* Ser. — Vix cæspitosus, scabridus.

F. (*E. giroflé*).

Geographical limits, 1386°.

N. Normandy, 48°.

S. Punjaub, 30°.

E. Punjaub, 77°.

W. Normandy, 0°.

Vettonica coronaria (mediæval Latin of *Ruellius*).

Caryophyllus flore majore (*Dodoens*, 1583).

Caryophyllus hortensis simplex (*Caspar Bauhin*, 1596).

Caryophyllus sylvestris, *alpinus minor*, *dilute purpureis*, *odorus* (*Francesco Cupani*, 1696).

Caryophyllus simplex, *flore minore pallide rubente* (*Tournefort*, 1694).

Caryophyllus sylvestris, *flore rubro inodoro*, *calyce oblongo cum brevibus unguibus* (*Sequier*, 'Plantæ Veronenses,' 1745-1754).

Pre-Linnean references. — The Carnation seems to have been unknown to the ancients, for we have no mention of it by any of the Roman poets, nor is it anywhere referred to by Pliny. Chaucer the poet calls it "clove girofle," which is Norman French. The next reference to it is by Manfredus de Monte Imperiali, who includes it in the group of "Tunici." Jacobus de Manlis indicated its habitat in Lombardy in a locality which was verified centuries later by Polycarp Sprengel as being one of the stations where the species was truly native, and growing under conditions which rendered its introduction very improbable. First called *carnation* by Lyte in his translation of Dodoens' work, and published in 1578; and *coronation* in a poem of Edmund Spenser's. Gerarde says of carnations, in his 'Herball' (1597):—"These are not used in physic, but esteemed for their use in garlands and nosegays, to deck the bosoms of the beautiful. They are good to be put into vinegar, to give it a pleasant taste and gallant colour." In the first edition of Dodoens' 'Kruydeboek' it is called by the old Flemish name of "groote Genoffel Bloemen." Mentioned by Tabernæmontanus in his 'Kreuterbuch' (1590). Forskahl, the Swedish traveller and pupil of Linnæus, observed it in cultivation in Arabia and Egypt, and in the gardens of Constantinople. The following are some of the vernacular names of the plant:—*English*, clove-pink, wild carnation, clove-gillyflower (*Old English*, jerefloure, gilfofre, girofer); *French*, œillet giroflé, œ. des fleuristes; *German*, grasrose Blume; *Flemish*, Angelier bloeme; *Italian*, garofano scempio; *Spanish*, Claveles; *Catalan*, clavell; *Portuguese*, Cravina; *Basque* (of Spain), chilipraya; *Luxemburg-Dutch*, Wel Armenee; *Dutch*, Anjelier bloeme; *Greek*, karuōphullon; in *Lower Egypt*, guruhfil; *Arabic*, karanfoli; *Japanese*, sogaif, or iammasiye; *Chinese*, hong nhung hoa. In the gardens of Hindostan it was observed in cultivation in the early part of the century by Roxburgh and Graham; also by Kaempfer and Thunberg in Japan.

Although the species is cultivated in all countries, its native habitat is extremely limited in Europe, as it is only really wild in France, the north of Italy, and the littoral provinces of Austria. Elsewhere, though long ago introduced, is scarcely indigenous. From it are derived all the varieties of the garden Carnations and

Picotees. In Germany and Italy it is the principal florists' flower, and from these countries the British florists procure their most esteemed varieties: these are arranged in three classes—Flakes, Bizarres, and Picotees. Flakes have two colours only, and their stripes large, quite through the petals of the flower. Bizarres are regularly spotted or striped with not less than three colours. Picotees have a white ground edged or pounced with scarlet, red, purple, or other colours.

As to the usual stations of the species, it is difficult to determine satisfactorily the most favourable soil for a plant which prefers to grow on old walls.

The specific name is derived from the Greek through the Latin *Caryophyllus* = *nut-leaf*, which is the name of a genus of small trees growing in the Moluccas, the dried flower-buds of which form the cloves of commerce.

26. *D. caryophylloides* Schult. — Cæspitosus. Caules 30 centim. teretes ramosi. Folia obtusa canaliculata 3-nervia, radicalia 124 mm. longissima, caulinea 100 mm. stricta, summis bracteiformibus, vaginâ folii diam. æquante. Flores geminati inodori. Bracteæ 4 obovatæ truncatæ mucronulatæ ad $\frac{1}{2}$ calycis partem. Calyx apice attenuato. Petala contigua, lamina = $\frac{1}{3}$ unguis.

F. S.

Geographical limits, 130°.

N. Carinthia, 47°. E. Transsylvania, 25°.

S. Catalonia, 42°. W. Pyrenees (French), 1° W.

So named from its superficial resemblance to the preceding, but differs from it in many points. Included in *D. sylvestris* Wulf. by the authors of the Spanish 'Flora,' and in the preceding species by many French botanists.

27. *D. longicaulis* Ten. — Cæspitosus. Caules 48 centim. ramosi tetragoni, internodis longis. Folia longissima gracilia carinata acuminata, radicalia 204 mm. flaccida 7-nervia, caulinea 160 mm. stricta 5-nervia. Flores geminati rosei. Bracteæ 6 orbiculares mucronatæ ad $\frac{1}{4}$ calycis partem. Calyx apice attenuato. Petala non contigua.

F. S.

Geographical limits, 90°.

N. North Italy, 46°. E. Croatia, 17°.

S. Dalmatia, 41°. W. Pyrenees (French), 1° W.

This plant, first recorded in Central Italy, is remarkable for the length of the nodes, and corresponding length of the leaves. It is of graceful habit, and has specious rose-coloured twin-flowers. First recorded in Spain by A. C. Costa in his 'Introduccion à la flora de Cataluna' (1864), p. 36.

28. *D. Boissieri Willk.* — *Glaucus*. Caules 38 centim. stricti simplices vel furcati teretes. Folia stricta carinata acuminata trinervia, radicalia 100 mm., caulinia 60 mm., vagina caulis diam. triplo longiore. Flores solitarii v. geminati. Bracteæ 6 obovatæ mucronatæ ad $\frac{1}{3}$ calycis partem. Petala non contigua rosea inæquali-dentata, lamina = $\frac{1}{4}$ unguis.

S. P.

Geographical limits.

N. Sierra Morena, 38°.

E. Japan, 142°.

S. Prov. Cadiz, in Spain, 36°. W. Prov. Algarve, in Portugal, 9°.

Named after the illustrious author of the 'Flora Orientalis.' First record in Willkomm's classical 'Icones et descriptiones pl. novarum, &c.' (1853), p. 22, on calcareous soil in Andalusia; grows also in Japan, according to Miquel.

29. *D. sinensis L.*, Linn. Sp. Plant., ed. 1, p. 411 (sensu latiore); *Rohrbach*, in 'Linnæa' (1870), vol. 36, p. 670. — *Cæspitosus*. Caules ramosi præsertim inferne tetragoni. Folia contorta stricta acuminata canaliculata 3-nervia, vagina folii diam. æquante; radicalia 64 mm., caulinia 40 mm. Bracteæ 4 ovali-lanceolatæ acuminatæ ad calycis apices. Calyx dentibus triangularibus 7-nerviis. Petala contigua.

var. asper Koch (= *D. Seguieri*, *auct. europ.*). — Inflorescentia paniculis florum solitariorum. Bracteæ interiores calycem vix dimidium æquantes, exteriores longiores haud raro subfoliaceæ, squarroso-patulæ.

var. sylvaticus Koch (non *Hpe.*). — Flores paniculati aut caulis uni- vel pauciflorus. Bracteæ adpressæ vel erectæ.

subvar. a. macrolepis Rohrbach. — Bracteæ sæpius foliaceæ elongato-lanceolatæ acuminatæ. Flores magni. Habitu valde glauca.

subvar. b. brachylepis Rohrbach. — Bracteæ breves late ovatæ, subito subulato-acuminatæ. Flores minores, interdum albi.

F. (C. sauvage des Indes). S. (C. del pastor). P. (C. da China).

Geographical limits, 9000°.

N. Coast of the Kara Sea, in Arctic Russia, on the European side of the R. Kara, 70°.

E. Near Hakodate, in the northern island of Japan, Jesso, 142°.

S. Near the mouth of the R. Mecon, in Cochinchina, 10°.

W. North Portugal, 8° W.

Caryophyllus sinensis supinus (Tournefort, 1694).

The actual Linnean specific name is spelled "chinensis," which, as a word, is etymologically bad. Rohrbach, who knew more about

the plant and its many forms, called it "sinensis": and as this is a much better word, it ought to stand, in spite of any sentiment about priority of nomenclature. And more than this, it was described under the name of "sinensis" by Tournefort, anterior to Linnæus; so that *a fortiori* the name should stand as it is thus written. As in the case of *D. fimbriatus*, there is no need to segregate the eastern and western forms as distinct species: the polymorphic tendency of the plant is sufficiently evident in its variability within a very limited area. And this brings us to the ever-important question, What determines a species, or how are we to circumscribe specifically the variations of individuals? As A. R. Wallace has shown, in every department of Nature there occur instances of the instability of specific form, which the increase of material aggravates rather than diminishes. A striking example of the kind is that adduced by Darwin himself in the case of the genera *Rubus* and *Rosa*; for though the amplest materials exist for a knowledge of these groups, and the most careful research has been bestowed upon them, yet from the very fact of the "embarras des richesses" the various species have not thereby been accurately limited and defined so as to satisfy the majority of botanists. It appears, that the deeper research is carried, the more one is inclined to believe that the delimitation of species is a purely arbitrary matter, and has to be accommodated to the particular needs of the genus which is being investigated. There are natural genera and (if I may apply the term) "critical" genera. The species of one kind may be grouped by distinctive and constant characters and habit, the species of another kind are intricately associated in a tangled web of affinities. Sir J. D. Hooker instances the same difficulty in his study of the Arctic flora. For though he has had much of the accumulated materials of his predecessors to work upon, he often expresses himself as unable to do more than group the numerous and apparently fluctuating forms into more or less imperfectly defined species. In his paper on the 'Distribution of Arctic Plants' he says:—"The most able and experienced descriptive botanists vary in their estimate of the value of the 'specific term' to a much greater extent than is generally supposed. . . . I think I may safely affirm that the 'specific term' has three different standard values, all current in descriptive botany, but each more or less confined to one class of observers. . . . This is no question of what is right or wrong as to the real value of the specific term; I believe each is right according to the standard he assumes as the specific."

Paul Rohrbach was of opinion that the western forms included in the *D. Seguieri* of France and Spain, and the *D. asper* of Central Europe, should be joined with the Chinese *D. sinensis*, and there are much better reasons for this than for his proposed absorption of *D. japonicus* by *D. barbatus*. Moreover, Fenzl was of the same opinion when he labelled his specimens of *D. Seguieri* with the name of *D. sinensis*, var. *brachylepis* (here also adopting the spelling of Tournefort). Even the bracts in *D. Seguieri* are often of the same form as those of *D. sinensis*, sometimes quite foliaceous,

elongated, and equalling the tube of the calyx, which form Rohrbach has often observed to be effected under cultivation. Rohrbach gives four sports of the subvar. *macrolepis*:—(1) flowers 20–30 mm. in diameter, petals obovate crenate, varying considerably in colour; (2) flowers 50–80 mm. in diameter, petals obovate inciso-dentate; (3) flowers nearly 100 mm. in diameter, petals cuneate with many narrow teeth; (4) flowers 30–50 mm. in diameter, petals linear-oblong, slightly bifid. He also mentions two sports of the subvar. *brachylepis*:—(1) stem 22–44 centim., leaves linear-lanceolate; (2) stem dwarfed, 5–15 centim., one or few-flowered, leaves linear. This last sport was described as a new species by N. Turczaninow, in 1832, under the name of *D. foliosus*. As pointed out by Rohrbach, the best diagnosis circumscriptive of the forms referable to this species as under *D. Seguieri* is that proposed by E. Regel in 1861, and which, abbreviated, is as follows:—“Caules erecti vel adscendentes, apice bifidi vel subpaniculato-ramosi vel rarius uniflori. Folia plana, lineari-lanceolata vel linearia. Flores solitarii, gemini vel fasciculato-aggregati. Bracteæ erectæ vel patentes, tubum dimidium calycis æquantes aut longiores et calycem subæquantes. Petala antice dentata.” Smith’s brief diagnosis in his ‘Synopsis’ (1794) is:—“Floribus solitariis, squamis calycinis subulatis patulis foliaceis tubum æquantibus, petalis crenatis, foliis lanceolatis”: which is a favourable example of brevity with perspicuity. On the other hand, Villars’ diagnosis of his plant is:—“Caule superne bifido: floribus subfasciculato-aggregatis vel paniculatis: floribus laxè dispositis, squamis calycinis membranaceis ovatis abrupte in acumen lanceolato-subulatum tubum æquans vel eodem 2–3-plo brevius attenuatis: foliis oblongo-linearibus linearibusve attenuato-acuminatis sub 3–5-nerviis atque caule scabris glabrisve.” Willkomm also remarks of this species (*D. Seguieri*):—“Planta variabilis, præcipue quoad squamarum calycinarum figuram florumque magnitudinem et dispositionem.” It is no wonder, therefore, that from the time the plant was described by Linnæus, great difficulty should have been experienced in the circumscription of the forms referable to this species.

A. G. Schrenk is the authority for the northern limit of the species in a MS. catalogue of plants which he made in a journey through the country of the Samoyedes (1837). J. Loureiro is the authority for the southern limit in his ‘Flora Cochinchinensis’ (1790). In England the cultivated form is known as the *Indian Pink*, in German it is *Busch-Nelke*, and in Japanese *Jama Suge*.

Subsectio 2. SYLVESTRES. — Caules tenues. Bracteæ mucronatæ. Capsula oblonga.

30. *D. sylvestris* Wulf. (sensu latiore mihi). — Cæspitosus. Caules simplices v. ramosi angulariter compressi. Folia linearia acuminata plana, summis bracteiformibus, vagina folii diam. æquante. Flores solitarii inodori. Bracteæ orbiculares truncatæ, $\frac{1}{4}$ calycis longit., coriaceæ. Calyx dentibus mucronulatis. Petala contigua, lamina = $\frac{1}{2}$ unguis.

- | | |
|---------------------------|--------------------------------|
| <i>a. forma typica.</i> | <i>d. bracteatus G. et G.</i> |
| <i>b. pratensis Jord.</i> | <i>e. ebracteatus G. et G.</i> |
| <i>c. saxicola Jord.</i> | <i>f. juratensis Jord.</i> |

F. (*Æ. sauvage*). S.

Geographical limits, 575°.

N. Austria (Galicia), 50°. S. Greece (Thessaly), 37°.
E. Turkey (Rumelia), 26°. W. Spain (Catalonia), 1° E.

Caryophyllus sylvestris vulgatissimus (*Caspar Bauhin*, 1596).
D. Caryophyllus, var. *e. inodorus* (*Linnaeus*).

The specific name (sometimes spelled “*silvestris*”) is from its usual station, in the woods of mountainous districts.

The disintegration of the species into segregates has been accepted by many French botanists. Jordan's forms, here classed as varieties, are distinguished as follows:—

var. pratensis.—Leaves carinate, adpressed; radical 148 mm., cauline 50 mm. Flowers geminal. Bracts 4. Calyx-teeth 7-nerved.

var. saxicola.—35 centim. Leaves canaliculate. Bracts 4, with purple edges. Calyx purple; teeth obtuse, 9-nerved.

var. juratensis (etym. Mt. Jura).—Leaves elongate-linear, carinate, adpressed. Flowers specious, geminal. Bracts 4. Calyx-teeth 7-nerved.—First recorded by Jordan near Pontarlier, in the dept. Doubs. The preceding variety is described as a species in Willkomm's ‘*Icones et descriptiones pl. novarum, &c.*’ (1853), and an excellent figure is given from the original specimens, which were found by Jordan near Lyons, on granitic soil, in the neighbouring dept. of Ain, and just within the limit of Western Europe (as here understood).

var. ebracteatus.—Upper and lower leaves similar.

var. bracteatus.—Uppermost leaves linear-ovate, bracteiform.

In France the species occurs in the central and eastern mountainous districts, as well as on both sides of the Pyrenees.

31. *D. laricifolius B. et R.*—Cæspitosus, glaucus. Caules 37 centim. subsimplices teretes. Folia carinata fere acicularia, radicalia 15 mm. acuta patentia incurva, caulinea 20 mm. acuminata stricta adpressa, vagina folii diam. triplo longiore. Flores parvi longe pedunculati. Bracteæ 4–6 exteriores lanceolatae, interiores obovatae, atting. $\frac{1}{3}$ calycis longit. Calyx apice attenuato, dentibus mucronatis. Petala non contigua, lamina = $\frac{1}{3}$ unguis.

S.

Geographical area.—Central Spain.

So named from the leaves resembling those of the larch. First record by Reuter, in 1841, who found it in dry thickets near San Rafael, on the granite of Sierra de Guadarrama, at an elevation of 1050 metres.

32. *D. attenuatus* Sm. — *Cæspitosus*, basi suffrutescens. Caules 50 centim. ramosi teretes. Folia plana acuta 3-nervia, radicalia 18 mm. incurva, caulinea 12 mm. adpressa, vagina folii diam. æquante. Flores solitarii aut gemini parvi, sæpe racemis cymosis aut paniculis laxis, inodori rosei. Bracteæ 6 oblanceolatae ad dimidium calycem. Calyx apice attenuato. Petala non contigua.

F. (*E. aminci*).

Geographical area.—French Pyrenees.

This species, first described by Sir J. Smith in 1794, is limited in its distribution to the dept. of Pyrenees Orientales. The plant referred to this species by Mariano del Amo, in his '*Flora fanerogamica de la peninsula Iberica*' (1873), vol. vi., p. 291, is the next species. Willkomm's subspecies (*ex* Pourret ined. in herb. Salvador), described in his '*Prodromus Floræ Hispanicæ*' (1878), vol. iii., p. 684, under the name of *b. catalaunicus*, is a Pyrenean form of *D. fimbriatus*, and has also been recorded on the French side by Timbal-Lagrave in 1880 (near Perpignan). According to Smith, this may be the plant described by Tournefort as "*Caryophyllus maritimus*, supinus, foliis angustissimis, aculeatus, multiflorus," or, as some French botanists think, the still older "*Caryophyllus sylvestris repens multiflorus*" of C. Bauhin.

33. *D. sabuletorum* Willk. — *Parce cæspitosus*. Caules 24 centim. uniflori teretes. Folia plana acuta 3-nervia, radicalia 9 mm. incurva, caulinea 12 mm. adpressa, vagina folii diam. æquante. Flores solitarii vel gemini parvi. Bracteæ 6 oblanceolatae ad dimidium calycem. Calyx apice attenuato, dentibus acutis. Petala non contigua.

S.

Habitat.—South Aragon.

First described by Willkomm in his '*Icones et descriptiones pl. novarum, &c.*' (1853), p. 10, tab. 4. Differs from the preceding in being smaller in all its parts, with graceful unifloral stems (occasionally slightly branched at the top), very short leaves, and small oblong petals. So named from its occurrence in sandy places. Among so many similar Pyrenean forms it is difficult to determine what is meant by Pourret's *D. pyrenæus*, described in 1780: the diagnosis agrees more with this species, though the authors of the '*Flore de France*' refer it to the preceding.

SECTIO IMPARJUGUM.

34. *D. aragonensis* Timb., '*Obs. Dianthus Pyrénées.*'—*Cæspitosus* glaber. Caules 15 centim. simplices teretes. Folia 25 centim. 3—5-nervia stricta patentia plana, vagina folii diam. æquante. Flores solitarii, lilacini. Bracteæ 6—8, inferiores ovali-lanceolatae, superiores obovatæ, mucronatæ ad

dimidium calycem. Calyx dentibus lanceolatis acuminatis. Petala non contigua, lamina obovato-cuneata dentata, = $\frac{1}{2}$ unguis.

S.

Habitat.—North Aragon.

First described, in 1867, in 'Mem. Acad. Toulouse,' ser. v., p. 242, from specimens gathered near Panticosa, in the Spanish Pyrenees. Very like *D. benearpensis* on the French side of the mountains, but differs in the number and form of the bracts. This and the next three species included in the section are all very similar, and appear to be closely allied to the polymorphic *D. ciliatus* of Italy and Dalmatia.

35. *D. multiceps* Cst. — Cæspitosus scaber. Caules 20 centim. simplices v. apice ramosi stricti teretes. Folia acuta stricta plana 5-nervia, radicalia 40 mm. recurva, caulinea breviora adpressa, vagina folii diam. æquante. Bracteæ 6 mucronatæ ad $\frac{1}{2}$ calycis partem subpungentes. Calyx apice attenuato, dentibus lanceolatis. Petala non contigua, lamina parva spathulato-cuneata dentata.

S.

Geographical area.—Catalonia.

Occurs in rocky and dry hilly stations in the mountainous parts of Catalonia. First described by Antonio Cipriano Costa in his 'Introduccion à la flora de Cataluna' (1864), p. 35; and so named from its rootstock, which is woody, creeping, and much branched.

36. *D. Costæ Willk.* — Cæspitosus asperulus. Caules 35 centim. stricti ramosi teretes. Folia stricta acuta plana 3-nervia, radicalia recurva, caulinea adpressa breviora, vagina folii diam. æquante. Bracteæ 10 inæquales, superiores ovato-lanceolatæ, inferiores oblanceolatæ, patentes dimidium calycem tegentes, obtusæ. Calyx apice attenuato, dentibus lanceolatis mucronatis. Petala non contigua, lamina obovato-cuneata dentata.

S.

Habitat.—South Catalonia.

Named after the describer of the preceding, and discovered by him on the 6th August, 1858, on rocky declivities of Mt. Montsech, in prov. Lerida. At first referred by him to *D. ciliatus*, but the latter differs from it in the following points:—Bracts and teeth of the calyx densely ciliolate; lamina of the petal larger, 6.2 mm. long, subrhombic crenato-dentate; capsule included; seeds oval, apiculate, ciliolate at the edges; stem angular at the base, glabrous, with much narrower and canaliculate leaves.

37. *D. legionensis W. et L.*, 'Prodromus Floræ Hispanicæ' (1878), vol. iii. — Glaber. Caules 30 centim. furcati teretes.

Folia acuta canaliculata, radicalia 19 mm., infer. caulinia 16 mm. patentia, super. caulinia 10 mm. stricta adpressa, vagina folii diam. æquante. Flores rosei longe pedunculati. Bracteæ 6 obovatæ ad $\frac{1}{2}$ calycis partem. Calyx apice attenuato, dentibus acutis. Petala non contigua, lamina integra obovato-cuneata, = $\frac{1}{2}$ unguis.

S. (C. de Leon).

Geographical limits.

N. Mountains of Asturias. E. R. Pisuerga.

S. Mountains of Castile. W. Portuguese frontier.

According to Prof. J. Lange, it occurs on the calcareous soil of plains in the (old) province of Leon (hence the name).

38. *D. virgineus* G. et G. — Cæspitosus, glaucus, glaber. Caules 20 centim., graciles angulati. Folia acuminata triquetra contorta, radicalia 14 mm. patentia, caulinia 8 mm. adpressa, summis bracteiformibus. Flores rosei odorati. Bracteæ 6, inferiores oblanceolatae, superiores obovatæ, coriaceæ mucrone herbaceâ, ad $\frac{1}{4}$ calycis partem. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua, lamina dentata oblongo-cuneata, = $\frac{1}{2}$ unguis.

F. (Æ. virginal). S.

Geographical limits.—Region of olives.

N. Department of Drôme, 45°. E. Southern Italy, 17°.

S. Morocco, 34°. W. Morocco, 6°.

In a masterly essay, published in 1846, D. A. Godron, one of the authors of the 'Flore de France,' exhaustively discussed the stability of the Linnean species, and successfully proved that it has no existence in nature in the form described in the 'Species Plantarum.' The following notes on the plant are an abstract from a translation of this essay, and put in an amended form:—

Linnaeus has described, under the name of *D. virgineus*, a plant gathered at Montpellier by Burser: and has added as a variety Dillenius' "Tunica rupestris folio cæcio molli, flore carneo," a pink which was only known to him from a drawing in the 'Hortus Elthamensis.' Smith, in his Synopsis of the genus *Dianthus*, has separated the plant of Dillenius from *D. virgineus*, and has described it as a distinct species by the name of *D. cæsius*. We have then only to deal with the first Linnean form. Here great disagreement exists among authors; this name has been applied by them to very different plants. Sims, Jacquin, and Host have given this name to *D. sylvestris* Wulf. DeCandolle, in the 'Flore Française,' recognises in a plant from the environs of Narbonne this *D. virgineus* L. gathered by Pourret, sent by him to Lamarck under the name of *D. pungens*, and afterwards described by Boissier under the name of *D. brachyanthus*. In the supplement to this work, DeCandolle distinguishes from this plant *D. subacaulis*, to which he

adds as a synonym *D. virgineus* Gouan lib. Koch thus expresses himself as to the plant which he considers the true *virginens*:—" *D. virgineus* Linnei, ad Monspelium crescens, differt (a *D. sylvestri*) caudiculis elongatis prostratis, foliis a basi sensim attenuatis, calyce dimidio minore, squamis ovatis, margine membranaceo latiore et mucrone longiore tenuioreque instructis." These characters tally perfectly with a plant which grows in many localities of the eastern Pyrenees, and which many French authors consider to be the real *D. pungens* of Linnæus.

According to Hablitz, *D. virgineus* is no other than *D. hirtus* Vill. *D. sylvestris*, *brachyanthus*, *subacaulis*, *pungens*, and *hirtus* have then each and all been considered as *D. virgineus*. But is it any one of these five species, or, being distinct, would French botanists have mistaken it? Such is the question which we discuss. In the first place, the station cited by Linnæus is precise, and can put us on the track: this station is Montpellier, and Gouan affirms that it is in the neighbourhood of this town that Burser gathered it. It therefore resolves it into the matter of identifying the plant with one of the species found in the district. Among these species so occurring we first eliminate *D. Carthusianorum*, *Armeria*, and *prolifer*, which have fasciculate flowers: then we read from Linnæus, "*Flos unicus in caule, interdum et alter ex ala folii supremi.*" It cannot be sought for among the fimbriate species, since he says the petals are simply crenulate; this, then, excludes *monspessulanus*. There are but two others in the environs of Montpellier. One is *D. deltoides*, a plant positively known, whose leaves are plane, linear, obtuse, and not subulate; the other is the wild carnation, *D. Caryophyllus* var. *coronarius* L., as cultivated in gardens. But in comparing the Montpellier plant with the cultivated plant, it is impossible to consider them as identical. Besides, the true *Caryophyllus* grows spontaneously neither in Languedoc, nor in Roussillon, nor in Provence. It is only met with on old castles and ruined walls of the western departments, from Bayonne to Quimper: but it is chiefly distinguished from the southern plant by its vigorous rootstock producing long, decumbent, barren shoots; by its larger leaves, nearly obtuse, rather thick, and not scabrous at the margins; and by its contiguous petals. If this Montpellier specimen is not the garden carnation, which in all probability it is not, what is it? Smith, in his Synopsis, affords a clue, though not very trustworthy. He says:—"Linnæus having originally described this in the first edition of the '*Species Plantarum*,' from Burser's herbarium preserved at Upsal, without at the same time having any specimen in his own, I had no means of determining it with certainty but by applying to Prof. Thunberg, who very obligingly sent me a drawing of the original specimen, by which it clearly appears that this is no other than the plant Jacquin has rightly taken for '*virgineus*,' and figured in his '*Fl. Austriaca*.' I have it from himself. Towards the latter part of his life, Linnæus, having had the pink in his garden at Upsal from the Alps, described it anew, forgetting that it was his own '*virgineus*,' and forgetting also that he had already named one *alpinus*, he gave that denomination to this supposed new

species. This error his son modified by re-naming it *rupestris*." However, in spite of Smith's dictum, *D. sylvestris* Wulf. and *D. virgineus* Jacq. being positively known, it seems inadmissible to associate either with the Linnean plant; neither does Wulfen's species grow in the neighbourhood of Montpellier. We cannot here do better than transcribe the description of the Linnean plant, emphasizing the differences between it and the *virgineus* of the authors of the 'Flore de France':—" *Caule subunifloro, corollis crenatis; squamis calycinis brevissimis, foliis subulatis. Radix perennis. Folia radicalia copiosa erecta in cæspitem imbricata acuminata, facies Statices fermis. Caules aliquot, spithamæi, quattuor articulis simplicissimis constantes, foliis minoribus et summis minimis e vagina perfoliata ortis. Calycis squamæ latæ ovatæ acutæ brevissimæ, paribus remotis. Corollæ limbus dimidio brevior tubo calycis, rotundatus crenatus. Flos unicis in caule, interdum et alter ex ala folii supremi.*" Here are a few minor characters of Godron's species. It is a plant of 12-36 centim., pale green or rather slightly glaucous, springing from a root which is often as long as the rest of the plant; stems slender, with obtuse angles; leaf-sheath a little longer than broad; flowers 1-5 on short peduncles at the top of the stem, rose-coloured, and fragrant; bracts 6, mucro herbaceous; calyx contracted above; teeth with membranous edges. Habitat: dry hills in the region of olives.

Taking these facts into consideration, and the errors in transcription, to which even such distinguished authorities as Linnæus and Smith seem to have been liable, I do not think that the stability of the Linnean plant can be maintained.

SECTIO TETRALEPIDES LEIOPETALA.

Subsect. 1. HISPANIOIDES.—Caules ramosi. Bracteæ atting. $\frac{1}{3}$ calycis longitudinem. Folia vagina diam. ejusdem æquante.

39. *D. hispanicus* Asso. — Glaber aut scaber, glaucus. Caules 25 centim. dichotome ramosi, inferne tetragoni superne teretes. Folia 20 mm. 3-nervia plana, radicalia acuminata patentia, caulinea acuta adpressa, vagina folii diam. æquante. Bracteæ mucronatæ adpressæ, inferiores ovales superiores obovato-oblongæ. Calyx apice attenuato, dentibus ovatis obtusis. Petala non contigua, lamina obovato-cuneata integra vel dentata, = $\frac{1}{2}$ unguis.

var. *australis* Willk., 'Prodromus Floræ Hispanicæ,' vol. iii.

var. *borealis* Willk., " " "

S. (Clavellina espanola; clavel del campo).

Geographical area.—Spain.

N. Near Tudela, in Navarre. E. Monsant, in South Catalonia.

S. Sierra Nevada, 950 metres. W. Mt. Toro, near Valladolid.

This species, which is essentially the Spanish pink, was supposed by Timbal-Lagrange to be the plant named by Linnæus *D. pungens*,

but this latter plant cannot really be identified with any known species. It grows on rocky cliffs and on the gravelly soil of dry pastures in Eastern, Southern, and Central Spain. First recorded in Aragon by Asso in 1779.

40. *D. hirtus* Vill.—*Cæspitosus scaber*. Caules 16 centim. teretes. Folia stricta acuminata; radicalia 37 mm. plana patentia, caulinea 25 mm. carinata adpressa. Bracteæ exteriores lanceolatae, interiores lanceolato-ovatae. Calyx dentibus lanceolatis acuminatis. Petala dentata non contigua, laminâ = unguem, purpurea.

var. vivariensis Jord.—Glaber, gracilis. Bracteæ mucronatae. Calycis dentes purpurascens (in dept. Ardèche).

var. parviflorus Benth.—Glaber. Lamina = $\frac{1}{2}$ unguis (in Andorra, 1826).

F. (Æ. herissé). G. S.

Geographical limits.

N. Colmar, in Germany.

W. Viladran, in the Spanish

S. Viladran, in the Spanish

Pyrenees.

Pyrenees.

E. Colmar, in Germany.

First record by Villars, in Dauphiny, in 1789. Occurs on calcareous and basaltic, and especially granitic cliffs, chiefly in the region of olives, but may attain an elevation of 1500 metres from the sea. The authority for the northern limit at Colmar, in Germany, is that of the authors of the 'Flore de France,' vol. i., p. 234, which of course at that time was in French territory. I have not noticed the fact of this addition to the German flora in recent books. The species is more frequent in that part of S.E. France outside the limit of these 'Notes,' where its distribution has been worked out in the local florulas. M. Verlot, in his 'Catalogue of the Plants of Dauphiny,' has adopted the dismemberment of the species *D. sylvestris* and *D. hirtus* proposed by Jordan, and not altogether to the advantage of the study of the segregates.

The name "*hirtus*" (contracted from "*hirsutus*") has reference to its pubescent habit.

41. *D. Requiennii* G. et G. — *Cæspitosus*, glaber, glaucus. Caules 35 centim. furcati 4-angulares. Folia trinervia plana adpressa. Bracteæ patentès acuminatae. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua, lamina = $\frac{1}{3}$ unguis.

F. (Æ. de Requien). S. (C. de Requien).

Habitat.—Pyrenees.

Found by Requien growing near Prats-de-Mollo, on the French side of the Pyrenees, and described by Grenier and Godron in 1848.

42. *D. cognobilis* *Timb.*, 'Obs. *Dianthus* Pyrénées.'—*Cæspitosus*, glaber, basi suffrutescens. Caules 15 centim. furcati 4-angulares. Folia trinervia carinata adpressa. Bracteæ adpressæ mucronulatæ membranaceæ. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua, lamina = $\frac{1}{2}$ unguis.

S.

Habitat.—Pyrenees.

Found by Timbal-Lagrange growing in the Spanish Pyrenees between Benasque and Castanèze, in Aragon. The authors of the 'Flore de France' have confused this plant with the preceding species of the eastern Pyrenees, of which they had only seen Requier's dried specimens, and had not examined the living plant.

Subsectio 2. *SÆTABENSES*. — *Glabri*. Caules ramosi. Bracteæ atting. $\frac{1}{2}$ — $\frac{2}{3}$ calycis longitudinem. Folii vagina diam. ejusdem æquante.

43. *D. Planellæ Willk.* — *Cæspitosus*, glaucus. Caules 44 centim. tenues divaricati teretes internodiis longis. Folia acuminata plana 3-nervia, radicalia 72 mm., caulinia 50 mm. Flores solitarii v. geminati parvi rosei, cymis laxis. Bracteæ ovales acuminatæ patentés. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala non contigua, lamina dentata oblongo-cuneata truncata.

S. (C. de Planellas). P.

Geographical area.—North and south of R. Minho.

N. R. Tombre, in prov. Corunna. E. Boundary of Galicia and Tras-

S. R. Douro, in Portugal. os-Montes.

W. West coast.

According to Prof. J. Lange, it occurs in the fissures of rocks and on dry sandy wastes; *e.g.*, in the neighbourhood of Tuy, in Spain, and Montalegre, in Portugal.

44. *D. Sætabensis Rouy*, 'Bull. Soc. Bot. France' (1882), p. 44.—*Cæspitosus*. Caules 40 centim. teretes. Folia flaccida trinervia plana, radicalia obtusa, caulinia acuta, summis bracteiformibus. Bracteæ mucronulatæ. Calyx apice attenuato, dentibus lanceolatis acuminatis. Petala integra aut dentata, lamina = $\frac{1}{2}$ unguis.

var. minor Rouy.

var. media Rouy.

S. (C. de Xativa).

Habitat.—Prov. Valencia.

Sætabis was the Roman name for a river and a town in Hispania Tarraconensis: (1) a small stream (*Sp. Alcoy*) S.W. of the River

Sucro (*Sp. Xucar*), and which flows into the sea near Alicant; (2) an important town of the Contestani, and a Roman municipium (*Sp. Xativa* or *Jativa*, otherwise *San Felipe*), which was situated on a hill S. of the Sucro, and was celebrated for its manufacture of linen.

There are good specimens of this plant in *Herb. Mus. Brit.*, from which, with the assistance of the original description, this species has been described, and its position in the genus determined. It appears to be sufficiently distinct from the other species of the east of Spain.

Subsectio 3. CINTRANI. — *Caules simplices. Bracteæ mucronatæ.*

45. *D. cintranus B. et R.* — *Glaber. Caudiculi longi prostrati. Caules 25 centim. teretes. Folia 48 mm. 3-nervia acuta plana flaccida, vagina caulis diam. æquante. Flores geminati. Bracteæ exteriores oblongo-ovatæ, interiores oblongæ, adpressæ ad dimidium calycem. Calyx apice attenuato, dentibus lanceolatis acutis. Petala non contigua, lamina oblongo-spathulata, = $\frac{1}{3}$ unguis.*

S. P.

Geographical limits.—The Peninsula, west of 4°.

N. R. Vouga, 40° 40'.

E. Sierra de Gredos, 5° 30' W.

S. Estuary of the Tagus, 38° 20'. W. Estuary of the Tagus, 9° 40'.

First discovered by Welwitsch on the Serra de Cintra, between the estuary of the Tagus and the coast. It grows on basaltic cliffs on the heights in the beautiful environs of the city of Cintra, justly celebrated for its palaces, shady valleys, and delightful climate; and the city which in Byron's estimation, before he saw Athens, had the finest situation in Europe:—

“Lo! Cintra's glorious Eden intervenes
In variegated maze of mount and glen.
Ah me! what hand can pencil guide, or pen,
To follow half on which the eye dilates
Through views more dazzling unto mortal ken
Than those whereof such things the bard relates,
Who to the awe-struck world unlocked Elysium's gates?

The horrid crags, by toppling convent crowned,
The cork-trees hoar that clothe the shaggy steep,
The mountain-moss by scorching skies embrowned,
The sunken glen, whose sunless shrubs must weep,
The tender azure of the unruffled deep,
The orange tints that gild the greenest bough,
The torrents that from cliff to valley leap,
The vine on high, the willow-branch below,
Mixed in one mighty scene, with varied beauty glow.”

‘*Childe Harold's Pilgrimage.*’

46. *D. insignitus* *Timb.*, 'Obs. *Dianthus* Pyrénées.' — Glaber. Caules 15 centim. angulariter compressi, tenues. Folia 20 centim. acuta plana stricta trinervia, vagina folii diam. æquante. Bracteæ ovali-lanceolatae, patentes ad $\frac{1}{2}$ calycis partem. Calyx dentibus lanceolatis mucronatis. Petala contigua, lamina orbiculari integra, = $\frac{1}{2}$ unguis.

S.

Habitat.—Spanish Pyrenees.

The authors of the '*Prodromus Floræ Hispanicæ*' join this plant with *D. pungens*. But, among other points, it differs from it in its non-cæspitose habit, being almost destitute of barren shoots, very smooth dwarfed stems, more alpine in its appearance, with the rootstock more pliant and scarcely woody, leaves longer and less pungent towards the apex, bracts equal and reaching to one-third of the calyx-tube, calyx not contracted above, with teeth 7-9-nerved, and ciliolate, lamina more rounded, entire or scarcely dentate, and = $\frac{1}{2}$ unguis. So that these two forms are more dissimilar than many segregates considered as distinct by sufficiently competent authorities in the analysis of polymorphic types.

47. *D. algetamus* *Graells*, *ined.* — Cæspitosus, glaucus, glaber. Caules teretes tenues. Folia 9 mm. acuta stricta trinervia carinata adpressa, summis bracteiformibus, vagina folii diam. æquante. Flores geminati rosei. Bracteæ ovato-lanceolatae ad $\frac{1}{2}$ calycis partem, patentes. Calyx purpureus, apice attenuato. Lamina dentata, obovata. — Hispaniâ endemicus.

S.

Geographical area.—Spain.

There is a well-preserved specimen so labelled in Herb. Mus. Brit. ex Herb. Graells., from the original station at Algete, near Madrid. I can find no published description of such a species, nor am I acquainted with any other new pinks described by Graells; so that this plant has been described from the Museum specimen. Somewhat similar in its characters to the preceding, but differs in general habit.

48. *D. brachyanthus* *Boiss.* — Cæspitosus glaucus, glaber. Rhizoma crassum perpendiculare multiceps interdum prælongum. Caules 25 centim. tenues graciles angulariter compressi. Folia stricta plana trinervia, radicalia 12 mm. acuta patentia, caulinea 8 mm. obtusa adpressa, vagina folii diam. æquante. Flores solitarii rosei parvi. Bracteæ orbiculares, ad $\frac{1}{2}$ calycis partem. Calyx apice attenuato, dentibus ovatis. Petala contigua, lamina integra obovata, = $\frac{1}{2}$ unguis.

var. montanus *Willk.* — Caules elongati apice sæpe furcati; turionibus propter stationem sæpius surculis transmutatis.

Flores in unguibus atque stylis dimorphici. Calyx 11—14 mm. Petala vix contigua.

var. ruscinonensis Willk. — Folia canaliculata sed non carinata. Petala non contigua.

var. humilis Nym. — Densius cæspitosus caulibus abbreviatis paucis.

var. macranthus G. et G. — Calyx duplo major. Lamina = unguem, dentata v. integra variante.

var. alpinus W. et L. — Minor, dense cæspitosus, læte virens vix glaucus. Caules 8 mm. interdum apice furcati, turionibus estipitatis dense congestis. Calyx 6—7 mm. Petala non contigua, lamina = $\frac{1}{3}$ unguis.

var. nivalis W. et L. — Nanus, 11 centim.: turionibus abbreviatis cæspitem depressum compactum formantibus, caulibus vere simplicissimis; valde glaucus. Calyx de basi subinflatus, 6—7 mm. Petala majuscula, non contigua, lamina exserta.

var. Godronianus Jord. — Caules uniflori. Folia glauca. Semina lævia (dept. Lozère).

F. S.

Geographical limits, 36°.

N. Department of Aude, 41°. E. Eastern point of the Pyrenees, 3° E.

S. Sierra Nevada, 37°. W. Asturias, 6° W.

This essentially polymorphic species of Western Europe occurs in rocky and gravelly places on the south coast of France, both sides of the Pyrenees, and in all the mountainous parts of Spain, with the exception of the north-west and west districts. Of its variability Willkomm writes:—"Speciei quoad staturam, foliorum petalorumque longitudinem et florum magnitudinem valde variabilis." The species is not to be confounded with Schur's homonym, which is an Hungarian plant. In the Sierra Nevada, Boissier found specimens beyond the snow-line, at an elevation of 3150 metres above the sea.

49. *D. Langeanus W. et L.*, 'Prodromus Floræ Hispanicæ' (1878), vol. iii., p. 690.—Cæspitosus, glaucus, glaber. Caules teretes. Folia 13 mm., 3-nervia, patentia stricta canaliculata mucronata. Bractææ $\frac{1}{2}$ calycis tubum tegentes. Calyx apice attenuato, dentibus lanceolatis obtusis 7-nerviis. Petala non contigua, lamina integra obovato-cuneata, truncata.

S. P.

Habitat.—N.W. Spain.

Named after Willkomm's distinguished collaborateur in the 'Prodromus Floræ Hispanicæ.' Grows in pastures and gravelly places in the mountainous districts of Leon, Asturias, and Galicia. First described by Willkomm as *D. hispanicus* var. *occidentalis*.

Subsectio 4. PUNGENTES. — Caules simplices. Bractæ acuminatæ.

50. *D. graniticus* Jord. — Infra scaber, supra glaber. Caules 15 centim. tenues 4-angulares. Folia 3-nervia acuta patentia, vagina folii diam. æquante. Bractæ inferiores lanceolatæ, interiores ovatæ, patentes ad dimidium calycem. Calycis dentes ovales acuti. Petala non contigua, lamina obovato-cuneata.

F. (Æ. du granit).

Area of distribution, 10°.

N. Gironde, 45°. E. Gard, 5° E.

S. Pyrenees, 43°. W. Gironde, 0°.

This species has been joined by some French botanists with *D. hirtus*, but it affects a very different soil, occurring in fissures of rocks, and sandy ledges of granitic formation, whereas the latter occurs on limestone cliffs in the zone of *Olea europæa*, chiefly in Dauphiny and Provence.

51. *D. pungens* G. et G. — Cæspitosus, glaber, basi suffrutescens. Caules 26 centim. angulati stricti. Folia trinervia stricta plana patentia apice pungentia, radicalia 12 mm. densa acuta, caulinea 9 mm. acuminata, vagina folii diam. æquante. Bractæ inferiores lanceolatæ, interiores ovaes, ad dimidium calycem. Calyx apice attenuato, dentibus lanceolatis mucronatis 9—11-nerviis. Petala non contigua, lamina inæquali-dentata, = $\frac{1}{2}$ unguis.

F. (Æ. piquant). S.

Geographical limits, 70°.

N. Dauphiny, 45°. E. Piedmont, 9°.

S. Valentia, 38°. W. Pyrenees, 1° W.

So named from the character of the leaves, which are, as the authors of the 'Flore de France' describe them, "insensiblement atténuées dès la base en une point subulée fine et résistante." The Linnean species described in the second 'Mantissa,' p. 240, cannot now be satisfactorily identified: the pre-Linnean name there given is "*Dianthus maritimus foliis pungentibus*" of Du Chesne MS. The nearest to the Linnean description is *D. furcatus* of Balbis, which is a positively known species, well described and verified from its original stations, and therefore has a perfect right to retain its name. Here is the Linnean description:—"Caules suffruticosi alternatim dense ramosi. Folia caulinea basi connato-vaginantia conferta vaginis tegentia ramulos, ramea leviter connexa vaginis distantibus: omnia linearia planiuscula angusta, acuminata subpungentia. Pedunculi ex apice ramorum lateralium, pedicellis 1-3-floris. Calycis squamæ 4 lanceolatæ calyce paulo breviores. Petala integerrima laminis longitudine unguium." For comparison, the points

in which it differs from the *pungens* of the authors of the 'Flore de France' and that of the 'Prodromus Floræ Hispanicæ' are in italics, and in these italics is included a fair proportion of the description.

The plant occurs in the fissures of rocks, and on the gravelly soil of hills in mountainous districts: the earliest record being in Valentia, in the east of Spain.

52. *D. serratus* *Lapeyr.*, 'Abr. Pyren. Hist.', p. 241.—*Cæspitosus*, *glaucus*, *glaber*, *basi suffrutescens*, 20 centim. *Folia stricta trinervia subpungentia*, *radicalia* 24 mm., *caulinia* 30 mm., *vagina folii diam. triplo longiore*. *Flores geminati rosei*. *Bractæ æquales patentes lanceolatae ad dimidium calycem*. *Calyx rubellus*, *dentibus lanceolatis acuminatis membranaceis*. *Petala non contigua*, *lamina dentata*.

F.

Geographical area. — The northern slopes of the Pyrenees and of the Swiss Alps.

This species is the *D. asper* var. *serratus* of DeCandolle's 'Prodromus,' and *D. subulatus* of Timbal-Lagrange. There are good specimens in Herb. Mus. Brit.: from these and from the published descriptions it appears to be sufficiently distinct from the other Pyrenean species. Sometimes united with the western form of *D. sinensis* (*Sequieri*), or with *D. collinus*; but it never grows to half the usual size of the latter. The rootstock is woody, and the stems not erect, but ascending; the edges of the bracts, as well as the calyx-teeth, are membranous.

53. *D. benearnensis* *Lor.*, 'Bull. Soc. Bot. France,' v. (1858), p. 327, t. 1.—*Caules* 20 centim. *tenues teretes uniflori*. *Folia* 25 mm. *ligulata patentia incurva*. *Bractæ adpressæ ad dimidium calycem*. *Calyx apice attenuato*, *dentibus lanceolatis acuminatis*. *Petala contigua*.

F. (Æ. de Béarn).

Habitat.—S.W. France.

This Pyrenean species was first recorded near Gabas in the Dept. of Basses Pyrénées, formerly called Béarn (hence the name). In 1868 a pink was found by the lake near the baths of Panticosa, on the Spanish side of the Pyrenees, which was referred by Timbal-Lagrange to this species, but the specific characters of the plant do not tally either with the description or the figure given by Loret; it is probably one of the two preceding species. So that it appears to be endemic on the French side of the mountains. The manner of naming a plant, as exemplified in this instance, is one to be recommended; in the case where, in a genus whose general distribution is fairly well known and comprehensive in its habitat, an apparently new form, sufficiently distinct from its congeners both

from those in the limited area within which it occurs and from those in distant localities, so far then as to seem to be endemic, a sufficiently adaptable and euphonious specific name is suggested by that of the place where it has been recorded.

Subgenus III.—PROLIFERASTRUM.

54. *D. prolifer* L.—Caules 50 centim. simplices vel ramosi, stricti graciles, suprâ angulares infrâ teretes. Folia plana, radicalia 17 mm. dilato-spathulata recurva; caulinea 15 mm. linearia acuta incurva, sursum decrescentia, vagina folii diam. æquante: phylla involucri exteriora mucronata, interiora obtusa punctulata longiora ferruginea scariosa, ad florum apices. Flores parvi pallido-purpurei inodori. Bracteæ patentès mucronulatæ ad calycis apices. Calyx gracilis, dentibus lanceolato-obovatis obtusis. Petala contigua, lamina barbulata obovata = $\frac{1}{3}$ unguis. Semina lævia.

var. nanus Godr. ('Flore de Lorraine,' 2e edition, 1861, i., p. 105).

var. scabrifolius Clav. ('Flore de la Gironde,' 1882, p. 156).

var. lævis Clav.

var. typica (in *Reichenbach*, icon. 5009).—"Glaber 40 centim."

E. (Childing P. or Limewort). F. (Æ. prolifère). G. (Sprössende Felsnelke). H. (Kopvormende Anjelier; Wël Armenee, *Luxemburg dialect*). B. (Kopvormige A.). S. (C. prolifero). P. (cravinha).

Geographical limits, 1650°.

N. Schleswig-Holstein, 55°.

E. Talysch, 49°.

S. Canary Isles, 30°.

W. Madeira, 17°.

Armeria prolifera (Lobel, 1570; Gerarde, 1597; Grisley, 1661).

Betonica coronaria squamosa sylvestris (Jean Bauhin, 1591).

Caryophyllus sylvestris prolifer (Caspar Bauhin, 1596; Zannichelli, 1712).

Caryophyllus floribus capitatis aggregatis, squamis calycinis ovatis obtusis muticis tubum superantibus (J. G. Gmelin, 1751).

Caryophyllus aridus (Moench, 1794).

Tunica prolifera (Scopoli, 1760).

Pre-Linnean references. — First record as a British plant (in Middlesex) by How in 1650, who calls it "Childing Sweetwilliam." Mentioned in Lobel's 'Kruydtboeck,' Gerarde's 'Herball,' Grisley's 'Viridarium,' C. Bauhin's 'Theatrum Botanicum,' J. Bauhin's 'Hist. universalis Plantarum,' Gmelin's 'Flora Sibirica,' Seguiet's 'Plantæ Veronenses,' and Wulff's 'Flora Borussica.' Called "strigoli" by the early Italian botanists. Introduced by the colonists, and imperfectly naturalized in North America.

As to its specific name, Asa Gray defines *prolifer*, as bearing progeny in the way of offshoots.

In the 'Flora Berolinensis,' the genus "*Kohlruschia*" was invented for this species, and the following points of generic distribution were relied upon by Kunth for its separation from the Linnean genus:—Flores capitato-congesti rarissime solitarii sessiles involucri universali scarioso cincti. Bracteolæ 2 scariosæ convolutæ. Calyx pentagono-tubulosus 15-costatus, inter angulos fere omnino scarioso-membranaceus, apice attenuato. Corolla caryophyllacea; petala retusa laminâ suberectâ ungue longâ lineolatâque. Capsula maturescens lateraliter fissus usque ad basin, oblongo-fusiformis. Seguier's figure wrongly depicts the bracts as acute; in the living specimens they are most distinctly mucronate, like the bracteiform leaves, which usually inclose the flower-head as an involucre consisting of three pairs. There is no perennial rootstock, or barren leafy shoots; and each stem or fork terminates in a small ovate-fusiform head of flowers. Dr. Boswell-Syme, in the 3rd edition of the 'English Botany,' says that in all the specimens he has had an opportunity of dissecting, he has been able to find only one bract to the calyx,—but they may not have been perfect specimens. The heads of flowers are about 18 mm. long, and the average individual flowers about 9 mm. in diam. The calyx is very narrow, and faintly ribbed.

In England it grows in sandy places and gravelly pastures in four counties only—Berks, Hants, Sussex, Norfolk, and in Jersey. In France it occurs on the light sandy soil of road-sides and dry places, and on the limestone along the Doubs and in the Vosges. In Spain, Boissier found specimens at an elevation of 600–1600 metres.

The authority for the northern limit of the species is that of the more recent German Floras; for the southern limit, the 'Catalogue of the Native Plants of the Canary Isles'; for the western limit, in the 'Botany of the Voyage of the *Herald*' (1852); and for the eastern limit, R. F. Hohenacker in 'Enum. pl. in it. per prov. Talüsch' (1838). In his 'Florule du Tarn' (1864), Martin-Donos notes a local form, scarcely of the nature of a variety, in which the stems are very slender, and forked almost from the base with emarginate or nearly entire petals; growing on sandy banks, and also on old walls.

55. *D. velutinus* Guss. — *Velutinus*. Caules simplices stricti graciles, suprâ angulares, infrâ teretes. Folia plana, radicalia lanceolato-lineariter recurva, caulinea lineariter stricta, sursum decrescentes, vagina folii diam. duplo longiore: phylla involucri epunctulata mucronulata ad florum apices. Inflorescentia capitulis 5–8 florum roseorum pedicellatorum inodorum. Bracteæ phyllis similes. Calyx dentibus obovatis obtusis. Petala contigua, lamina barbulata, = $\frac{1}{2}$ unguis. Semina tuberculata.

F. (Æ. velouté). S. P.

Geographical limits, 660°.

N. Crimea, 46°.	E. Armenia, 47°.
S. Algeria, 34°.	W. N. Portugal, 8°.

First described by Gussone in 1825, and so named from the glandular hairs with which the stem is covered. Often confused with the preceding species, from which, however, it is very distinct. Besides the general differences which are specified above, may be mentioned—the greater proportionate breadth of the radical leaves to the upper ones of the stem, the laxer inflorescence, and the almost bifid character of the petals. It grows on the dry pastures of mountains, often at high altitudes, *e.g.*, on Sierra Nevada, near Trevelez, at 1650 metres. In the 'Flore de France' (1848), it is only recorded from Corsica, but in the Essay of Timbal-Lagrave it is mentioned as occurring in the depts. of Pyrénées Orientales and Aude.

RATIO OF THE SPECIES OF WESTERN EUROPE TO THE WHOLE
NUMBER OF SPECIES KNOWN:—

55 species, *i. e.*, 24 per cent.

Spain.—43 species, *i. e.*, 18·61 per cent.

France.—33 species, *i. e.*, 14·29 per cent.

Portugal.—13 species, *i. e.*, 5·6 per cent.

Germany.—7 species, *i. e.*, 3 per cent.

Belgium.—5 species, *i. e.*, 2·2 per cent.

Holland.—5 species, *i. e.*, 2·2 per cent.

England.—4 species, *i. e.*, 1·731 per cent.

ERRATUM.

On p. 22, line 11, for
"rosea infra pallida," read "rosei infra pallidi."

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